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### Listerian Oration.<sup>1</sup>

#### THE HEALTH OF THE FŒTUS, OR TRUE NATIONAL INSURANCE: A REVIEW OF CERTAIN ASPECTS OF FŒTAL ENVIRONMENT.

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It is no mere formality for me to say how much I appreciate the honour of being selected to deliver your twentieth Listerian Oration. Quite properly, the honour is protected by a heavy duty: the laurel wreath must be by labour hardly won. Let it be so; not all our joys should lie in slothful ease.

<sup>1</sup> Delivered at a meeting of the South Australian Branch of the British Medical Association at Adelaide on May 25, 1939.

The essence of my task, as I see it, is to interpret for myself and my audience something of the fundamental significance of Lister's career and to derive from it an abiding inspiration. Fortunately for the purpose, the student of medicine is more suited to this undertaking than is the student of history. Indeed, formal historians appear to have sadly neglected Lord Lister. Had my reading been confined to our current university texts I should have learnt nothing of him. Even humanitarian historians, such as H. G. Wells<sup>(1)</sup> and A. L. Morton,<sup>(2)</sup> appear to have missed the imperishable theme of Lister's humane achievement. Such writers may bear lightly the responsibility for neglecting him; his colleagues could never be guilty of such ingratitude. Sir St. Clair Thomson,<sup>(3)</sup> who was his house surgeon in 1883, declared in a recent address that Lister had "wrought more for the relief of bodily suffering, for the security of human

life, than any one man who had ever trod this earth".

We must rely for our text, then, on the narrative of medical writers. Outstanding among these is Lister's nephew, Sir Rickman Godlee,<sup>(4)</sup> although his admirable biography by no means exhausts the Listerian literature. Noteworthy contributors have been those previous orators, my predecessors, who, mounting this rostrum, have passed in brilliant cavalcade before you.<sup>(5 to 23)</sup> Anatomists and physiologists, pathologists and bacteriologists, physicians and surgeons have all found inspiration, either substantial or symbolic, in Lister's many-sided influence on matters pertaining to the healing art.

We of the British Medical Association are doubtless proud, and justly so, of Lister's nationality. We may secretly rejoice that "in spite of all temptations to belong to other nations" he was born an Englishman. But this is to let the poison of nationalism enter our souls and distort our historical perspective. Lister was primarily a healer of men—a philanthropist, if you consider the term in its widest sense, a humanitarian, a man of mankind.

The Victorian era, to which he belonged, has often been derided in these later days, but it witnessed an extraordinary effulgence of the nation's genius. In almost every department of human activity it produced men of outstanding intellect and brilliant achievement. Lister's fame, however, transcends age and nationality. Posterity will remember him not merely as a brilliant Englishman, not merely as a contributor to the cultural development of the nineteenth century, but rather as the genius who opened the door to a new epoch in human progress.

The surgical revolution, of which he was the leader, has proved to be a world-wide revolution; it has attained in our time a catholic beneficence for mankind of every colour and every creed, for Christian and pagan, cultured and crude, for urban and rural, noble and knave. This tangible contribution to civilization must ensure the immortalization of Lister in the annals of the world at large.

For us in the world of medicine his life has a spiritual as well as a material significance. To make my meaning clear I shall imagine a miracle. Suppose that Joseph Lister were to live again in our generation: would it not be inevitable that preventive medicine would claim him, that the master surgeon would naturally become the prelate of prevention? Much the same idea was expressed by C. E. Goddard<sup>(24)</sup> in a Listerian jubilee address, when he said: "Let us hope that the time is not far distant when, seeing what one man achieved in his lifetime, we shall realize more fully how much there is still to be done in medical and surgical science, and especially the best of all causes—the science of preventive medicine and public health."

Goddard agrees with me that spiritually the life of Lord Lister means much to preventive medicine. In this "best of all causes" we shall surely find community of thought and action, not only with

Lister but with one another, since the prevention of disease is the aspiration of us all.

With everything in our world changing rapidly, the structure of medicine is changing also. Listerism has long since been tested and accepted, and fresh enlightenment is being sought in other directions. Advances in the basic sciences of chemistry and physics have produced changes as vast and as fundamental as the surgical revolution of a few years earlier; chemotherapy has contributed to the decline of syphilis and is on the way to similar conquests of septicæmia and gonorrhœa; the biochemistry of the vitamins, hormones and carcinogens is full of fascinating possibilities, whereas the chemical concept of morphogenesis has added a new interest to embryology.

Revolutionary progress in physics has had equally far-reaching effects on medical practice. The discovery of radioactivity, both natural and artificial, has given rise to specialisms devoted to radio-diagnosis and radiotherapy. The newer knowledge concerning the structure of the atom has led to a method for the therapeutic bombardment of tumours with high velocity neutrons; the recognition of isotopes has provided a useful means for "labelling" atoms, of special value in metabolism research.

Nor, with the coming of the twentieth century, has revolution been confined to the scientific basis of medicine. Social progress has profoundly modified the conditions of medical practice. Modern sociology is a blend of economics, philanthropy and science, with medicine as a major element. New responsibilities and new points of view have been imposed upon the individualistic practitioner of former days. The "beloved physician" of today no longer marches alone; abreast of him stride the directors of this and that medical service. Commerce, industry and defence; groups, communities and nations; one and all have come to recognize that public health and preventive medicine are vital to individual and corporate prosperity.

The social aspect of medicine is nowhere better illustrated than in the department of obstetrics and gynaecology, charged as it is with the care of those to whom we owe our birth and to whom we owe our children. Here, at the very threshold of life, lies the goal of preventive medicine—to study and determine the conditions which will ensure health and vigour for children yet unborn.

From what I have been saying you will gather my reasons for choosing as the subject of this address "The Health of the Fœtus, or True National Insurance".

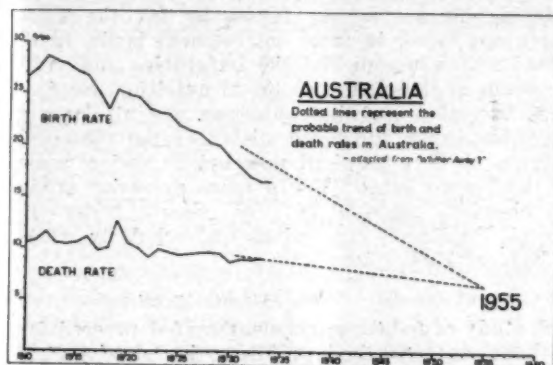
#### National Importance of Fœtal Hygiene.

It requires but little acquaintance with vital statistics to perceive that the theory and practice of fœtal hygiene are matters of supreme national importance. In the present era a steadily falling birth rate is casting a blight over most of the white race, while the wombs of Asia and Africa are recklessly littering the earth. Increased expectancy



of life will not compensate for failed fertility, so that, biologically speaking, the western world faces a catastrophe comparable with the slow, agonizing fall of Rome, unless, by way of Nature's insurance, white women can be persuaded to bear a few more children apiece.

It is generally held that the Australian continent should contain a considerably increased population; yet the trend of the fertility curve indicates that, unless there is an unexpected change, natural increase will dwindle to zero by 1955 (Graph A).



It seems odd that at this juncture eugenic societies are encouraging poorer class birth control, whilst the Government is encouraging poorer class immigration. Surely it would be wiser to reverse the programmes: Government to eliminate home-grown poverty, eugenics to eliminate foreign-grown unfitness!

As shareholders in this going concern we might glance for a moment at the profit and loss account of "Australian Population Limited" (see the accompanying "statement"). In 1937 we find that out of

**AUSTRALIAN POPULATION LTD.**  
STATEMENT OF ACCOUNTS  
for 12 months to June, 1937.

Cr.		Dr.	
To Live births .. ..	119,131	By Deaths .. ..	64,496
		.. Balance: Natural Increase .. ..	54,635
.. Arrivals from Abroad ..	69,802	.. Departures Abroad ..	64,599
		.. Balance: Net Migration ..	5,203

SUMMARY.

Gross Gains .. ..	188,933	Gross Losses .. ..	129,095
Net Increment .. ..	59,838		

a net increase of 59,838, "natural increase" accounted for 54,635. This figure includes 3,129 infants who perished within a very short time of birth. During the same period there was a calculated loss of 40,000 from abortion<sup>1</sup> (36,812) and stillbirths<sup>2</sup> (3,574).

<sup>1</sup> Calculated by the application of Taussig's formula (United States of America).

<sup>2</sup> Calculated by the application of the Victorian percentage to Australia as a whole.

It is a somewhat staggering truth that in any one year the natural increase of our population is nearly equalled by the number of wasted conceptions. Admittedly much of this relative sterility is deliberate race suicide, outside the scope of medical control; on the other hand, preventive obstetrics should be in a position to prevent some at least of the wastage.

However, increasing the birth rate alone will not solve the population problem; physical fitness is of even greater significance. Of what consequence is numerical strength if numbers of individuals are handicapped throughout life by developmental defects, congenital stigmata or birth injuries? Of what value is increased fertility if numbers of newborn are prejudiced by malicious prenatal influences and are unable to establish a satisfactory extra-uterine existence? These are the questions that confront the constructive statesman who is striving to rear a biologically fit people.

"If we but knew the laws which govern ante-natal health and the causes which produce ante-natal disease and death to what might we not expect the possibilities of hygiene to grow!" exclaimed Ballantyne.<sup>(25)</sup> It was this attitude that led him in 1901 to urge the establishment of prematernity hospitals in the interests of the foetus and child. Some years later his mind was dominated to a lesser degree by foetal pathology and he came to realize that the expectant mother also might derive advantages from antenatal supervision.

As we are aware, it was not long before Ballantyne's ideas gained adherents, and a widespread establishment of antenatal clinics followed. Unfortunately the benefits we were led to expect have failed to materialize. It is a matter of common knowledge that the maternal death rate has not fallen; foetal mortality has probably increased; neonatal mortality remains unchanged—in grim contrast with the fall in the total infant mortality rate.

The fact that some antenatal clinics have achieved consistent success proves that the results in general need in no way discredit the scientific basis of ante-natal care. Not only is knowledge concerning the foetus and its environment a satisfying study in itself, but, properly applied, it cannot fail to have beneficial results.

There could be no better avenue for obstetrical research and endeavour than that which leads to the preservation of foetal health. This indeed is true national insurance.

A rational system of foetal hygiene must consider the following questions: What constitutes health in the foetus? What is known of the origin, nature and termination of foetal morbidity? What methods are available for the detection and treatment of foetal injury and disease? By what means can morbid states of the foetus be prevented? Adequately to present the subject would require a treatise on the whole range of prenatal medicine; you need have no fear that I contemplate anything of the

sort. It will be necessary, however, to define briefly the limits and time incidence of prenatal pathology, of which foetal pathology is a part.

#### Prenatal Pathology.

Prenatal pathology is concerned with all the morbid processes which act upon the organism before birth, and with the effects produced by their action. Broadly speaking, therefore, prenatal pathology not only treats of intrauterine life, but takes into account morbid inheritance transmitted through the germ plasma, and morbid effects projected into post-natal life. In this way prenatal pathology covers three very unequal time intervals; they are in retrospect: (a) the intranatal period or parturition, (b) the antenatal period or pregnancy, and (c) the ancestral period or progeniture. The antenatal period may be further divided into embryonic and foetal.

It is known that morbid influences may act upon an individual at any stage of prenatal history; the results vary with the period during which these influences act. As typical examples of this diversity of action one may mention: (a) the genealogical diseases of the ancestral period; (b) the malformations and monstrosities of the embryonic period; (c) the matrifugally transmitted diseases and intoxications of the foetal period; (d) the accidents and traumatism of the intranatal period.

Not uncommonly morbid states, initiated in one period, may be carried over to successive periods and even projected into post-natal life. It follows, therefore, that the health of the foetus and new-born depends upon a normal inheritance (eugenics), normal environment (eucyesis) and safe delivery (eutocia). The remainder of this address is concerned chiefly with eucyesis, or a review of certain phases of foetal environment.

#### The Environment of the Foetus.

The *foetus-in-utero* attains its characteristic individuality in an environment conditioned by the vital processes of the mother. Foetal environment may be considered under two heads: (a) the foetal hydrosphere, consisting of *liquor amnii*, which is primarily protective, and (b) the foetal biosphere, consisting of placenta, membranes and maternal tissues, which is primarily formative.

The foetal hydrosphere is of importance in regulating the temperature and external pressure to which the foetus is subjected, and further, it provides a water reserve for use in foetal metabolism. Quite recently the *liquor amnii* has been revealed in a new light by the work of Snyder and Rosenfield.<sup>(26) (27)</sup> These authors have shown that the mature foetuses of the cat, rabbit, guinea-pig and man show rhythmical respiratory movements within the uterus, instead of a prolonged state of apnoea. This means that the first respiration is not initiated at birth, and that breathing of amniotic fluid is a normal function of foetal respiration. I have been able to confirm this work in the guinea-pig, but in a premature human foetus a similar experiment gave

negative results.<sup>(28)</sup> It remains to be seen whether this discovery will influence prenatal medicine. Snyder and Rosenfield have suggested a pathological significance in connexion with atelectasis and foetal pneumonia. These phenomena may shed light on the pathogenesis of hydramnios.

Mention of hydramnios recalls the fact that we can drain the foetal hydrosphere by the operation of *paracentesis uteri*, and also that accidental drainage following spontaneous rupture of fragile membranes is not an unusual feature of habitual abortion.

Though the amniotic hydrosphere is of considerable significance to the foetus, by far the most important factor in foetal environment is the foetal biosphere, on account of the imperative and vital functions of the placenta. Foetal nutrition, respiration, excretion and immunization are all largely dependent upon the biochemistry of the placental barrier, so that we shall now briefly review some of the known facts. For a more extensive study of chemical embryology one should refer to Joseph Needham's stupendous and scholarly work, "Chemical Embryology".<sup>(29)</sup>

#### Biochemistry of the Placental Barrier.

A study of foetal environment cannot proceed far without encountering problems in physiological chemistry. No doubt many of us are accustomed to think of the body cell as the unit of living structure and to regard molecules and atoms as belonging to a rather theoretical conception of matter. It is essential, however, that we grasp the fact that the chemistry of the "stuff we're made of"<sup>(30)</sup> does not differ from the chemistry of inanimate matter—that metabolites, vitamins, hormones and enzymes are actual chemical entities with known molecular patterns.

By applying these ideas to embryology, we find that the drama of human development takes on a new significance. As the action unfolds, we realize that the amazing sequence of anatomical changes from fertilization to birth is based upon a series of physico-chemical episodes. In other words, ontogenesis has a physico-chemical basis.

Throughout nine months of intimate physiological commerce a brisk traffic in solid, liquid and gaseous material goes on between mother and offspring; the transference operates across the placenta—a remarkable biological device for closely approximating the two circulations without prejudice to the autonomy of either.

Placed as it were at the receipt of customs, the placental barrier is in a position to control the biochemical exchanges so indispensable to foetal economy. What commodities are permitted to pass this living frontier? Is there unrestricted free trade after the manner of a simple filter, or is there a discriminating tariff ordering selectivity? The experimental physiologist finds these questions difficult to answer by reason of the fact that the placenta differs in histological and physiological constitution, not only with different animals, but, in some cases, with the stage of gestation.



TABLE I.

Grosser's Classification.	Uterine Mucosa. (Maternal.)				Chorion. (Fetal.)				Macroscopic Form.	Example.
	Blood.	Endothelium.	Connective Tissue.	Epithelium.	Epithelium.	Connective Tissue.	Endothelium.	Blood.		
Epithelio-chorial ..	+	+	+	+	+	+	+	+	Diffuse.	Pig, horse, ass.
Syndesmo-chorial ..	+	+	+	-	+	+	+	+	Multiplex.	Cow, sheep, goat.
Endothelio-chorial	+	+	-	-	+	+	+	+	Zonary.	Dog, cat.
Hæmochorial ..	+	-	-	-	+	+	+	+	Discoid: (i) Labyrinthine. (ii) Olliform.	Mole, mouse, rat. Man, ape, guinea-pig.

Grosser,<sup>(21)</sup> of Prague, has pointed out that mammals vary very much in the degree of proximity between foetal and maternal circulations, and from his studies of comparative placentation he has charted the number of distinct structures that are interposed between the two blood systems in the various mammalian groups (Table I). According to Grosser, whose London lectures I attended in 1932, the placental formations of all mammals involve an intact chorion, but vary in the extent to which the uterine tissue layers participate in placental construction. Thus in the simplest type an intact uterine mucosa is apposed to the chorion and the placenta is called epithelio-chorial. In the succeeding type the uterine epithelium is lost; the maternal connective tissue being now in contact with the chorion, the placenta is denominated syndesmo-chorial. Still more reduced is the uterine mucosa in those forms in which the chorion reaches the maternal vascular endothelium—skeletalizes, as it were, the capillaries; this type of placenta is called endothelio-chorial. And finally, in the remaining type the endothelium also is broken down and the chorion becomes directly bathed by maternal blood; this variety is called hæmochorial. The human placenta is hæmochorial in constitution and olliform or villous in pattern.

Returning now to the question of what substances permeate the placental barrier, we find evidence that not only do the chemicals which make up the foetal body pass from the woman to her unborn child, but that certain substances foreign to the foetal constitution will in certain circumstances also pass the placental barrier. Needham has constructed an ingenious table from the literature concerning placental permeability for about sixty different substances (Table II). By plotting the size of the molecule against the type of placenta used in each experiment he obtained a curve which showed that permeability varied inversely with molecular weight and with the number of tissue layers separating the two circulations. Thus no placenta was permeable to proteins or antigens, and all placentæ were permeable to ethyl alcohol.

Using Cunningham's classification,<sup>(22)</sup> we may divide the substances passing through the placenta into three classes: (a) diffusible substances meeting with no placental mechanism for acting on them, that is, most, if not all, of the excretory products of the embryo, mineral metabolites, oxygen and a large number of foreign substances, mostly toxic; (b) substances to which the placental barrier is impermeable, owing simply to degree of diffusibility

TABLE II.

SUBSTANCE — Arranged more or less in order of molecular weight	EPITHELIO-		SYNDESMO-		ENDOTHELIO-		HÆMO-CHORIAL		Mouse
	Pig	Horse	Cow	Goat	Dog	Cat	Duned Pig	Rab- bit	
Various Proteins									
Tetanus and Diphtheria Toxins									
Various Antitoxins	-	-	-	-	-	-	+	+	+
Ferric Ammon. Cit.							+	+	+
Thyroxine	-			+	+	+	+	+	+
Pituitrin							+	+	
Insulin				+	+	+	+	+	+
Amino-acids				+			+		+
Strychnine and Curare				+	+	+	+	+	+
Hyoscine and Morphine				+	+	+	+	+	+
Pot. or Sod. Iodid, Br, Cl.	-		+	+	+	+	+	+	+
Arsphenamine, Salvarsan							+	+	+
Iodoform									+
Ether							+	+	+
Chloroform							+	+	+
Ethyl Alcohol							+	+	+

or to some similar cause, for example, formed elements of the blood, large particles such as carbon granules, bacteria, and slowly diffusing large molecules of protein or dyestuff; (c) substances which meet a regulatory mechanism in the tissues of the placenta, designed to take out of the maternal blood such items as amino-acids, fatty acids and iron compounds, and secrete them into the foetal circulation.

The foregoing summary of placental biochemistry will serve to illustrate two main interests of embryology: (a) the formation of the finished embryo out of the egg cell, (b) the protection of egg cell and embryo from the changes and chances of this mortal world.

In discharging its foetus-forming function, the placenta insists, as it were, that the body-building bricks shall be small, and leaves it to the synthetic capacity of the foetus to do the structural assemblage. In discharging its foetus-protecting function, the mature hæmochorial placenta holds back particulate matter, such as blood corpuscles and large protein molecules. Maternal blood could never be introduced into the foetus for two reasons: first, because the embryonal blood vessels could not sustain maternal blood pressure, and second because the two individuals are chemically distinct—as witness the frequent incompatibility of blood groups in mother and child.

#### Intrauterine Infection.

It is significant that non-pathogenic organisms behave like inert particles of similar size; they do not permeate the healthy placenta. From time to time, however, pathogenic varieties certainly succeed in gaining entrance to the foetus. Such matrifugal infections of the foetus presuppose a lesion of the placenta which permits a breach of the protective barrier. Congenital syphilis in man is a classical instance of such an occurrence; other pathogens known to infect the human foetus are *Bacillus anthracis*, *Bacillus typhosus*, pneumococcus, *Plasmodium malarie* and *Trypanosoma brucei*. The viruses also, though considerably smaller, doubtless infect the foetus by active penetration of the placenta, for example, rabies in dogs. Foetal measles and foetal smallpox have been recorded in man. It is conceivable that a foetus might suffer any type of intrauterine infection with recovery prior to birth, but this is pure conjecture.

Nevertheless the question of so-called inherited immunity is one that has attracted considerable attention. It is not truly genetic in origin, but is conveyed from mother to child through either the placenta or the milk or both. Placental transmission of antitoxins, antibodies, precipitins and agglutinins appears to be peculiar to the hæmochorial group.

And now, you might well ask, where does all this lead us as clinicians?

#### Clinical Considerations.

The clinical custody of foetal health is no sinecure; it requires the vigilant exercise of all our faculties—diagnostic, therapeutic and prophylactic. Clinically considered, it is not possible to separate antenatal, intranatal and neonatal problems; there must be unity of obstetric responsibility throughout.

The peculiar difficulties of antenatal diagnosis and treatment are attributable to the sequestered situation of the foetus; that these difficulties are not entirely resolved by the revelation of birth is

indicated by the haphazard and uncertain vocabulary used in the certification of neonatal deaths. (*Vide addendum.*)

Edith Potter<sup>(32)</sup> has made an exhaustive *post mortem* study of stillbirths and neonatal deaths, and reports her conclusion that practically all are due to prenatal causes. The commonest of these causes are: (a) prenatal interference with exchange of metabolites, (b) birth injuries, (c) prematurity, (d) congenital malformations, (e) foetal infections.

It should be mandatory for clinical obstetrics to reduce the number of these catastrophes to an absolute minimum. This can be achieved only by better obstetrics; which means closer study of ætiological factors and an improved diagnostic and therapeutic technique.

*Prenatal Interference with the Exchange of Metabolites.*—The first group—prenatal interference with exchange of metabolites—is the largest and most important. The clinical manifestations vary with the particular metabolite or metabolites involved and with the mode of interference, whether acute or chronic.

The commonest clinical type is due to a lack of oxygen in the blood going to the foetus—foetal anoxæmia. This may be acute or chronic. Acute anoxæmia follows such mishaps as detachment of the placenta and compression of the cord. With complete obstruction of the cord the foetus has only three minutes to live. Chronic anoxæmia follows extreme degrees of anæmia and other anoxæmic states in the mother.

Another common clinical type is due to chronic foetal starvation or partial deprivation of one or more of the several food factors. The question of foetal dietetics will be discussed later. Other clinical types are due to interference with the exchange of products of foetal excretion due to azotæmic states of the mother *et cetera*.

The diagnosis and clinical management of these several conditions will be found discussed in standard text-books, but much that is new has not found its way into these manuals.

It should be emphasized that in the all-important cases of *asphyxia neonatorum*, especially if the cord is still pulsating, the child may frequently be recovered by prompt injection of analeptics (lobeline, "Coramine", strychnine) into the umbilical vein.

*Birth Injuries.*—The next group—birth injuries—covers a variety of intranatal injuries and accidents which we cannot discuss now. I need not labour the point that the protection afforded by the amniotic hydrosphere is almost as indispensable to the foetus in transit as it is to the *foetus-in-utero*; and that early rupture of the membranes and oligo-hydramnion are conditions which expose the foetus to the hazards of a dry labour.

*Prematurity.*—Potter's next group—prematurity—describes an incident rather than a pathological condition. The criteria of prematurity have recently



been officially defined by a joint committee of the Royal College of Physicians and the Royal College of Obstetrics and Gynaecology.

There is no doubt that prematurity, like abortion, has a miscellaneous aetiology. One cause that may be mentioned is malnutrition or under-nutrition. When interference with foetal nutrition occurs in polytocous animals foetal autolysis is the usual result rather than abortion or prematurity; in this way some of the litter may be saved.

In a case of premature birth nursing care will decide the fate of the infant; the underlying principle is to imitate as far as possible the intra-uterine environment. Dr. Kate Campbell<sup>(34)</sup> and her staff recently reared a "prem" that could not have been more than twenty-two weeks in gestation.

**Congenital Malformations.**—Congenital malformations of the new-born are readily demonstrated at autopsy, but are usually unsuspected during foetal life. The major skeletal defects may be shown by antenatal radiography, and according to Strassman,<sup>(35)</sup> of the Mayo Clinic, disorderly action of the heart can be detected in foetal electrocardiograms indirectly recorded by the utilization of maternal leads. M. D. Silberberg recently recorded for me a direct electrocardiogram of a five-months Cæsarean foetus with placental circulation intact. The type of curve did not differ from that of the adult form. Another modern instrument for antenatal diagnosis is the photostethoscope of da Costa.<sup>(36)</sup>

**Foetal Infections.**—As regards the group of foetal infections, the only one of practical interest is congenital syphilis. The reduced incidence of familial syphilis has been a triumph for preventive medicine. In 1921 Fairley<sup>(37)</sup> and Fowler<sup>(38)</sup> found evidence of *ante partum* syphilis in from 7.5% to 10% of women attending the antenatal clinic of the Melbourne Women's Hospital; recent observers<sup>(39)</sup> at the Queen Victoria Hospital, Melbourne, have found the incidence to be less than 1%.

The key to the situation is a routine blood test in pregnant women. Our results and those of other observers<sup>(40)</sup> show that a syphilitic mother who does not receive treatment during pregnancy has only about a 35% chance of giving birth to a healthy baby; the same woman with adequate antenatal treatment has a 95% chance of doing so. Surely a classical exercise in public health!

It is the generally accepted opinion that the basis of antisyphilitic treatment during pregnancy is to prevent or cure syphilis in the baby. Do not push the treatment with the idea of curing the mother. If you begin early in pregnancy you will probably prevent foetal infection; beginning later, you will probably cure established disease.

#### *Foetal Pharmacology.*

Mention of the antenatal treatment of foetal syphilis at once introduces the topic of foetal pharmacology and toxicology. Medicinal or toxic influences may be brought to bear on the foetus

only through the agency of the foetal biosphere. Mercury, bismuth and arsenic all permeate the placental barrier and exert their antisyphilitic action on the foetus.

The matrifugal transference of quinine is of practical importance in connexion with antimalarial measures during pregnancy, and also by reason of the common practice of quinine induction of labour. Studying a series of drug inductions, Dilling and Gemmel<sup>(41)</sup> found a regular transference of quinine to the foetus and 1.83% unaccountable stillbirths. Though they considered there was a causal relationship between the two observations, it was not a quantitative one; in other words, an individual idiosyncrasy to quinine had to be postulated.

Since narcotics and anaesthetic vapours are so frequently administered during labour, we should pause to consider their effect on the foetus before giving them. In a recent publication by Irving<sup>(42)</sup> *et alii* it was demonstrated that of all children born from undrugged mothers, less than 2% failed to breathe spontaneously; on the other hand, with some of the drugs now used, the depressant effects were so powerful that 35% to 65% of children born under their influence failed to breathe. Wisdom suggests that in any case in which a difficult operative delivery is impending, preliminary narcotics should be omitted for fear of severe *asphyxia neonatorum*; the combined effects of anoxæmia and drugging of the foetal circulation may so depress the respiratory centre that it will no longer react to the stimulus of carbon dioxide.

As regards other pharmaceuticals, one could name a long list of these that pass over from mother to foetus; strychnine, aspirin, sulphanilamide and various hormones are a few of the many. Of interest to dental pathology is Murray's<sup>(43)</sup> proof of the permeability of fluorides.

#### *Foetal Dietetics.*

Wasting diseases and suspected avitaminoses are not uncommonly found in the new-born. Jefferis Turner<sup>(44)</sup> has endeavoured to connect neonatal mortality with maternal nutrition by comparing the cities of Brisbane and Adelaide. For the period 1932 to 1936 (inclusive) the comparison was much in favour of Adelaide, whereas formerly both cities were equally bad. To quote Turner, "all over Queensland the most important cause of malnutrition among women is the great deficiency of milk in their diet". By contrast he said, "during the depression the South Australian Government adopted the wise policy of supplying milk rations to the unemployed". If Turner's hypothesis adequately explains the facts—and it is a reasonable explanation—we must assume that cow's milk is effective because it provides essential food factors and vitamins.

Reports of work on the transference of vitamins from mother to child are being published in current literature; but it would appear that much remains to be done on the clinical side. Such a research

project should appeal to your new Institute of Medical and Veterinary Research, as well as to the new King George V Jubilee Institute attached to the Women's Hospital, Melbourne.

For several years now nutrition has been a prominent topic in the agricultural and medical journals of many lands. Australian delegates take credit for impressing the League of Nations with the international importance of the subject; certainly the Assembly found it safe and innocuous to discuss during the political crisis of September, 1938. I rather suspect that the original motive of our delegates was to secure world-wide advertisement of Australian foodstuffs. Imagine their discomfiture when it was discovered by the Australian Advisory Council on Nutrition that minor degrees of malnutrition are prevalent throughout large sections of the population, and this in spite of our bounteous supply of natural foods.

Midst all the clamour concerning nutrition we have heard far too little about prenatal requirements. As well as perfecting the dietary of expectant mothers, we should pay attention to the needs of the mothers of tomorrow. Whilst the nutrition of pre-school children is being seriously studied in this country, the nutrition of boarding-school children is not being brought under review. That growing girls should be so unsatisfactorily fed at many expensive schools is a matter of concern, not only to parents but to the nation, and if the Schools' Association cannot see the wisdom of sharing the services of an experienced dietitian, some form of compulsory supervision should be instituted.

#### Conclusion.

And now the time has come to end this talk which you and I conspired to call an oration! In deference to the forbearance of my audience I think we should spell the word oration!

It is probable that at no time did Lord Lister ever willingly accept responsibility for a case of childbirth; consequently he is not identified with obstetrics in the same way as that other genius, Semmelweis. Semmelweis, however, lacked the power and the personality to convert his observations into unassailable doctrine, with the result that it remained for Lister to redeem obstetrics from the age-old curse of puerperal sepsis. Lister, therefore, is responsible for a double deliverance—the rebirth of twin sciences, obstetrics and gynaecology.

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#### Addendum.

The infantile deaths in Victoria occurring from various causes during 1936 are set out in the accompanying table. The figures have been kindly supplied by the Government Statist, Melbourne.



## Infantile Deaths from Certain Causes at Different Ages, Victoria, 1936.

Cause.	Age.					Total.	Males.	Females.
	Under One Week.	One Week and under One Month.	One Month and under Three Months.	Three Months and under Six Months.	Six Months and under Twelve Months.			
<b>Congenital malformations (157):</b>								
Congenital heart malformation .. .. .	31	5	3	2	3	44	28	16
Congenital heart, anoxemia .. .. .	1	—	—	—	—	1	1	—
Congenital heart, asthenia .. .. .	—	—	—	1	—	1	1	—
Congenital heart, atelectasis .. .. .	3	—	—	—	—	3	1	2
Congenital heart, bronchopneumonia .. .. .	1	—	—	—	—	1	1	—
Congenital heart, cyanosis .. .. .	1	—	—	—	—	1	1	—
Congenital heart, entero-colitis .. .. .	1	—	—	—	—	1	—	1
Congenital heart, imperforate anus .. .. .	1	—	—	—	—	1	—	1
Congenital heart, mongolism .. .. .	2	—	—	—	—	2	2	—
Congenital heart, pneumonia .. .. .	—	1	—	1	—	2	1	1
Congenital heart, umbilical sepsis, general peritonitis .. .. .	—	1	—	—	—	1	1	—
Congenital heart and viscera .. .. .	1	—	—	—	—	1	1	—
Congenital absence of anus .. .. .	1	—	—	—	—	1	1	—
Congenital imperforate anus, oesophageal atresia .. .. .	1	—	—	—	—	1	1	—
Congenital atresia of bile duct, jaundice .. .. .	1	—	—	—	—	1	1	—
Congenital absence of common duct, cholemia .. .. .	1	—	—	—	—	1	1	—
Congenital obliteration of bile duct, gastric hemorrhage .. .. .	—	—	—	1	—	1	—	—
Congenital deformity of pharynx and larynx .. .. .	1	—	—	—	—	1	—	1
Congenital dilatation of colon .. .. .	—	1	—	—	—	1	1	—
Congenital stenosis of bile duct .. .. .	1	—	1	—	—	2	—	2
Congenital tracheo-oesophageal fistula .. .. .	1	—	—	—	—	1	—	1
Congenital oesophageal stricture .. .. .	1	—	—	—	—	1	1	—
Congenital polycystic kidneys, toxæmia .. .. .	—	1	—	—	—	1	1	—
Congenital abnormalities .. .. .	1	—	—	—	—	1	1	—
Congenital abnormalities, deficient skull bones .. .. .	1	—	—	—	—	1	1	—
Congenital deformities .. .. .	1	—	—	—	—	1	1	—
Congenital hydrocephalus .. .. .	3	1	2	2	2	10	6	4
Congenital hydrocephalus, spina bifida .. .. .	1	—	—	1	—	2	1	1
Anencephalus .. .. .	5	—	—	—	—	5	2	3
Cleft palate .. .. .	—	1	—	1	—	2	2	—
Dextrocardia .. .. .	1	—	—	—	—	1	1	—
Encephalocoele .. .. .	1	1	—	—	—	2	1	1
Hare-lip, cleft palate, marasmus .. .. .	—	—	1	—	—	1	1	—
Imperforate anus, deformed scrotum and penis .. .. .	1	—	—	—	—	1	—	—
Malformation .. .. .	2	—	1	—	—	3	3	—
Meningocele .. .. .	—	1	—	—	—	1	1	—
Meningomyelocele .. .. .	—	1	—	—	—	1	1	—
Patent ductus arteriosus (since birth) .. .. .	—	1	—	—	—	1	1	—
Patent foramen ovale .. .. .	4	—	—	—	—	4	—	4
Prematurity, congenital heart defect .. .. .	1	—	1	—	—	2	—	2
Pyloric stenosis .. .. .	2	1	3	—	—	6	3	3
Pyloric stenosis, inanition .. .. .	—	—	2	—	—	2	—	2
Pyloric stenosis, operative shock .. .. .	—	—	1	—	—	1	—	1
Pyloric stenosis, post-operative peritonitis .. .. .	—	—	1	—	—	1	—	1
Pyloric stenosis, localized peritonitis .. .. .	—	1	—	—	—	1	1	—
Pyloric stenosis, congenital debility .. .. .	—	—	—	1	—	1	—	1
Spina bifida .. .. .	3	1	1	—	—	5	—	5
Spina bifida, paraplegia .. .. .	1	—	—	—	—	1	—	1
Spina bifida, bronchopneumonia .. .. .	1	—	—	—	—	1	—	1
Spina bifida, meningitis .. .. .	1	1	—	—	—	2	1	1
Imperforate anus, mongolic imbecile .. .. .	—	—	—	—	—	—	—	—
Other .. .. .	1	1	—	—	—	2	—	2
<b>Total .. .. .</b>	<b>88</b>	<b>21</b>	<b>17</b>	<b>10</b>	<b>5</b>	<b>136</b>	<b>81</b>	<b>55</b>
<b>Wasting diseases (158):</b>								
Asthenia .. .. .	—	2	—	—	—	2	2	—
Asthenia, exhaustion .. .. .	1	1	—	—	—	2	1	1
Asthenia, heart failure .. .. .	1	—	—	—	—	1	1	—
Asthenia, malnutrition .. .. .	—	—	—	1	—	1	1	—
Atrophies .. .. .	—	—	—	1	—	1	1	—
Cachexia .. .. .	—	—	1	—	—	1	—	1
Cardiac failure .. .. .	4	—	—	—	—	4	4	—
Cardiac failure, respiratory failure .. .. .	1	1	2	—	—	4	2	2
Congenital cardiac insufficiency .. .. .	3	—	—	—	—	3	3	—
Congenital heart failure .. .. .	1	—	—	—	—	1	1	—
Congenital dropsy .. .. .	1	—	—	—	—	1	—	1
Congenital maldevelopment .. .. .	1	—	—	—	—	1	—	1
Congenital weakness .. .. .	—	1	—	—	—	1	—	1
Debility .. .. .	3	—	—	—	—	3	3	—
Debility, heart failure .. .. .	3	—	—	—	—	3	3	—
Heart failure .. .. .	2	—	—	—	—	2	2	—
Heart failure, toxæmia .. .. .	—	—	—	—	—	—	—	—
Inanition .. .. .	3	1	—	—	—	4	1	3
Inanition, cardiac failure .. .. .	—	—	2	—	—	2	—	2
Inanition, toxæmia .. .. .	—	—	1	—	—	1	—	1
Inanition, underdevelopment .. .. .	1	—	—	—	—	1	—	1
Malnutrition .. .. .	1	1	1	1	3	7	3	4
Malnutrition, congenital debility .. .. .	—	—	1	—	—	1	—	1
Malnutrition, heart failure .. .. .	1	—	—	—	—	1	—	1
Marasmus .. .. .	—	—	3	5	4	12	9	3
Marasmus, asthenia .. .. .	—	—	—	—	—	—	—	—
Marasmus, cardiac failure .. .. .	—	—	1	3	—	4	1	3
Marasmus, inanition .. .. .	—	—	—	—	—	—	—	—
Toxæmia (from mother) .. .. .	—	—	—	1	1	2	—	2
Respiratory failure .. .. .	3	—	—	—	—	3	1	2
Underdevelopment, debility .. .. .	1	—	—	—	—	1	—	1
Other .. .. .	1	—	—	—	—	1	—	1
<b>Total .. .. .</b>	<b>84</b>	<b>7</b>	<b>14</b>	<b>13</b>	<b>7</b>	<b>75</b>	<b>45</b>	<b>30</b>

## Infantile Deaths from Certain Causes at Different Ages, Victoria, 1938.—Continued.

Cause.	Age.					Total.	Males.	Females.
	Under One Week.	One Week and under One Month.	One Month and under Three Months.	Three Months and under Six Months.	Six Months and under Twelve Months.			
<b>Injury at birth (160):</b>								
Birth injuries .. .. .	1	1	—	—	—	2	—	2
Breech presentation .. .. .	1	—	—	—	—	1	—	1
Cerebral hemorrhage .. .. .	25	7	—	—	—	32	20	12
Cerebral hemorrhage, asphyxia neonatorum .. .. .	1	—	—	—	—	1	—	1
Cerebral hemorrhage, asphyxia pallida .. .. .	1	—	—	—	—	1	1	—
Cerebral hemorrhage, atelectasis .. .. .	1	—	—	—	—	1	—	1
Cerebral hemorrhage, cardiac failure .. .. .	1	—	—	—	—	1	1	—
Cerebral hemorrhage, convulsions .. .. .	1	1	—	—	—	2	1	—
Cerebral hemorrhage, difficult birth .. .. .	1	—	—	—	—	1	—	—
Cerebral hemorrhage, eclampsia .. .. .	2	—	—	—	—	2	2	—
Cerebral hemorrhage, hemorrhagic disease of newborn .. .. .	1	—	—	—	—	1	1	—
Cerebral hemorrhage, melena neonatorum .. .. .	1	—	—	—	—	1	—	1
Cerebral hemorrhage, pneumonia .. .. .	1	1	—	—	—	2	—	1
Cerebral compression .. .. .	1	1	—	—	—	2	2	—
Cerebral compression and hemorrhage .. .. .	1	—	—	—	—	1	1	—
Cerebral pressure .. .. .	1	—	—	—	—	1	1	—
Cerebral birth injury .. .. .	2	—	—	—	—	2	2	—
Difficult birth .. .. .	3	—	—	—	—	3	—	3
Difficult birth, intracranial pressure .. .. .	1	—	—	—	—	1	—	1
Dystocia .. .. .	1	—	—	—	—	1	—	1
Intracranial hemorrhage .. .. .	6	1	—	—	—	7	3	4
Intracranial hemorrhage, atelectasis .. .. .	1	—	—	—	—	1	1	—
Intracranial hemorrhage, hemorrhagic diathesis, cellulitis .. .. .	1	1	—	—	—	2	1	—
Malpresentation, atelectasis .. .. .	1	—	—	—	—	1	1	—
Obstructed labour, forced delivery .. .. .	1	—	—	—	—	1	1	—
Occipito-posterior presentation, intracranial hemorrhage .. .. .	2	—	—	—	—	2	—	2
Prematurity, cerebral hemorrhage .. .. .	1	—	—	—	—	1	—	1
Prematurity, intracranial hemorrhage .. .. .	1	1	—	—	—	2	2	—
Prolapse of umbilical cord, asphyxia neonatorum .. .. .	1	—	—	—	—	1	1	—
Subtentorial hemorrhage, cerebral edema .. .. .	1	1	—	—	—	2	—	2
Torn tentorium, cerebral hemorrhage .. .. .	1	1	—	—	—	2	2	—
Traumatic injury at birth, meningeal hemorrhage .. .. .	1	—	—	—	—	1	—	1
Other .. .. .	2	—	—	—	—	2	—	2
<b>Total .. .. .</b>	<b>65</b>	<b>16</b>	<b>—</b>	<b>—</b>	<b>—</b>	<b>81</b>	<b>48</b>	<b>33</b>
<b>Other diseases of early infancy (161):</b>								
Asphyxia .. .. .	2	—	—	—	—	2	—	2
Asphyxia neonatorum .. .. .	6	—	—	—	—	6	4	2
Asphyxia pallida .. .. .	1	—	—	—	—	1	1	—
Atelectasis .. .. .	15	4	—	—	—	19	10	9
Atelectasis, asphyxia .. .. .	1	1	—	—	—	2	2	—
Atelectasis, familial tetanus gravis .. .. .	1	—	—	—	—	1	—	1
Atelectasis, heart failure .. .. .	5	—	—	—	—	5	3	2
Atelectasis, respiratory failure .. .. .	2	—	—	—	—	2	1	1
Hæmatemesis .. .. .	1	—	—	—	—	1	—	1
Hæmatemesis and melena .. .. .	1	—	—	—	—	1	—	1
Hæmolytic jaundice .. .. .	1	—	—	—	—	1	—	1
Hemorrhage of newborn .. .. .	9	1	—	—	—	10	8	2
Hemorrhagic diathesis, hæmatemesis melena neonatorum .. .. .	1	—	—	—	—	1	—	1
Hæmorrhagic neonatorum .. .. .	6	2	1	—	—	9	6	3
Hemorrhage of intestine .. .. .	1	—	—	—	—	1	1	—
Hemorrhage of lung .. .. .	1	1	—	—	—	2	2	—
Icterus gravis neonatorum .. .. .	—	1	—	—	—	1	1	—
Icterus gravis neonatorum, asthenia .. .. .	1	—	—	—	—	1	—	1
Icterus neonatorum .. .. .	—	1	—	—	—	1	—	1
Icterus neonatorum, pulmonary edema .. .. .	—	1	—	—	—	1	—	1
Icterus neonatorum, inanition .. .. .	—	1	—	—	—	1	—	1
Insufflation, asphyxia .. .. .	45	1	—	—	—	46	23	23
Melena neonatorum .. .. .	9	—	—	—	—	9	5	4
Purpura .. .. .	—	1	—	—	—	1	1	—
Toxic jaundice .. .. .	1	1	—	—	—	2	1	1
Scleroderma .. .. .	—	1	—	—	—	1	—	1
Other .. .. .	3	—	2	—	—	5	2	3
<b>Total .. .. .</b>	<b>115</b>	<b>19</b>	<b>3</b>	<b>—</b>	<b>—</b>	<b>137</b>	<b>73</b>	<b>64</b>

A REVIEW OF EXPERIENCE WITH CYCLOPROPANE.<sup>1</sup>

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AN attempt has been made to review a series of 2,018 anaesthetics given in the course of private practice extending over a period of three and a

half years, and to contrast post-anæsthetic morbidity and mortality in the cases in which cyclopropane was used with the morbidity and mortality of those in which other agents were used.

The data that appear in the following tables have been culled from standard anæsthetic record sheets, kept as a routine, and, where obtainable, from a post-anæsthetic record sheet, which will be described later.

Table I shows the different agents which were employed in the series.

<sup>1</sup>Read at the annual meeting of the Australian Society of Anaesthetists on April 3, 1939, at Melbourne.



TABLE I.

Agent.	Number of Cases.	Percentage of Total.
Cyclopropane .. .. .	776	33.3
Ether .. .. .	612	26.2
Nitrous oxide .. .. .	480	20.6
"Avertin" .. .. .	232	9.9
"Procaine" .. .. .	67	2.9
"Percaine" .. .. .	63	2.7
Barbiturates ("Evipan Sodium" and "Pentothal Sodium") .. .. .	48	2.1
Paraldehyde .. .. .	35	1.5
Others (ethyl chloride, chloroform, "Vinyl ether") .. .. .	19	0.8
Total .. .. .	2,332	

It will be seen from the totals in Tables I and II that more than one agent or technique was sometimes employed in the one anaesthetic. The tables do not include some hundred odd cyclopropane anaesthetics given at the Perth Hospital; for uniformity of recording these have been omitted.

Table II shows the techniques employed in the series.

TABLE II.

Techniques.	Number of Cases.	Percentage of Total.
Absorption (mask, endotracheal and Leech gas-way) .. .. .	1,142	48.9
Endotracheal (inhalation method) .. .. .	487	20.9
Rectal .. .. .	267	11.4
Open drop .. .. .	121	5.2
Foregger or Magill (non-absorption) .. .. .	102	4.3
Spinal and caudal .. .. .	91	4.0
Intravenous .. .. .	48	2.1
Regional .. .. .	45	1.9
Oral insufflation .. .. .	20	1.3
Total .. .. .	2,332	

The "Leech gas-way" mentioned in Table II is a useful adjunct in gas anaesthesia, especially when the gas is cyclopropane. It is a well-designed pharyngeal airway with a metal projection on the end, which hooks up the epiglottis. Round the distal end of the airway fits a solid rubber plug, which is a cast of an average adult pharynx. It is remarkable how many a pharynx it fits in an airtight manner. If the fit is not airtight, a small amount of gauze packing on each side of the airway will make it so. The use of this apparatus is an alternative method in certain cases in which the endotracheal technique would otherwise have been utilized; it has advantages over the latter technique, in that the airway can be introduced at a lighter plane of surgical anaesthesia than the endotracheal tube and that the rare complications of intubation are eliminated. It is fully described.<sup>(1)</sup>

One hint not mentioned by Leech I have found of use: instead of smearing the plug end of the airway with "Vaseline" I use "Percaine" ointment, which supposedly gives a partial anaesthesia to the pharyngeal mucous membrane and prevents the local reflex from occurring if the anaesthetic level should be inadvertently lightened.

# Post-Anæsthetic Morbidity.

In an endeavour to assess the type of sequelæ which were occurring in the post-anæsthetic period of the cyclopropane cases, and to compare them, if possible, with those occurring after the use of other agents, I handed a copy of the following post-anæsthetic record sheet to the sister in charge of the patient, at the termination of the operation, with the request that it be forwarded to me on the discharge from hospital (or demise) of the patient.

## POST-ANÆSTHETIC RECORD

No. .... Date .....

Name .....

Time of recovery of full consciousness:

Restlessness None  
Slight  
Moderate  
Severe

Vomiting None  
Slight (once or twice)  
Moderate (up to 12 hrs.)  
Over 12 hrs.  
Kind of vomitus

Cough None  
Dry  
With sputum  
With sputum, plus temp.  
Any respiratory depression  
Any cyanosis

Pulse No change  
Change in volume  
Change in rate  
Any irregularity

Distension None  
Slight  
Moderate  
Acute

Any other complication of note in post-operative period:

Discharge from Hospital

It was impossible for me to follow the patient through the convalescent period with any degree of detail; and although the post-anæsthetic record sheet leaves much to be desired, it was within the capabilities of the sister to tick off the appropriate sub-headings and add any relevant information.

Altogether I received back some 430 completed records, covering a fairly representative series of both the cyclopropane cases and the "Other" cases. The "Other" series includes ether (both "open" and given by endotracheal inhalation), nitrous oxide (semi-closed, closed mask, Leech gas-way and endotracheal), spinal anaesthesia ("Stovain", "Novocain" and "Percaine") and "Pentothal Sodium" given by the intravenous route.

Table III gives in percentages the comparative results of the two series.

Admittedly the method of recording the post-anæsthetic period is somewhat crude; but it nevertheless allows a direct comparison to be made between the two series. Although the difference in post-anæsthetic morbidity, as shown, is not a great one, it must be confessed that the balance lies in favour of the "Other" series. The same comment, however, which I shall make later when discussing the deaths, applies here.

TABLE III.

Observation.	Anæsthetic Series.	
	Cyclopropane. Percentage Cases.	"Others." Percentage Cases.
Restlessness:		
None .. .. .	82.0	65.0
Slight .. .. .	27.2	26.0
Moderate .. .. .	7.2	7.5
Severe .. .. .	3.8	1.5
Vomiting:		
None .. .. .	28.5	36.8
Slight (once or twice) .. .. .	48.4	40.0
Moderate (up to twelve hours) .. .. .	16.5	14.0
Severe (over twelve hours) .. .. .	6.6	9.2
Cough <sup>1</sup> :		
None .. .. .	81.0	82.8
Dry .. .. .	6.0	12.0
With sputum .. .. .	5.6	1.5
Sputum plus fever .. .. .	3.1	1.5
Respiratory depression .. .. .	1.4	1.5
Cyanosis .. .. .	2.9	0.7
Pulse:		
No change .. .. .	71.0	76.4
Change in volume .. .. .	6.6	6.5
Change in rate .. .. .	18.0	12.3
Irregularity .. .. .	4.4	5.0
Distension:		
None .. .. .	83.1	86.6
Slight .. .. .	9.5	10.5
Moderate .. .. .	7.0	2.8
Acute .. .. .	0.4	0.6

<sup>1</sup> Two patients in the cyclopropane series and one in the "Other" series developed pleurisy.

#### Anæsthetic and Post-Anæsthetic Deaths.

Every endeavour was made to find out post-operative deaths, and reliance for this information was not placed on the return of the post-anæsthetic record sheet alone. I am confident that the list includes the majority, if not all, of the deaths which occurred in the usual post-operative period in hospital. They are shown in Table IV.

TABLE IV.

Anæsthetic Agent.	Number of Cases.	Deaths.		Wisconsin Percentages. Year 1934-1935.
		Number.	Percentage.	
Cyclopropane .. .. .	776	40	5.2	4.35
"Other" series .. .. .	1,342	35	2.6	2.40
Total .. .. .	2,018	75	3.7	3.48

This looks like a black mark against cyclopropane; but in extenuation (and the same thing applies to the post-anæsthetic morbidity figures) it must be pointed out that in some cases cyclopropane was used in combination with other agents, and that in many cases of the "poor risk" type cyclopropane was decided upon as the most suitable anæsthetic.

I include the Wisconsin results for several reasons: first, to show that the ratio of the percentages of deaths as between the cyclopropane and

the "Other" series is approximately the same in both their records and my own; secondly, to point out that the Wisconsin results are even better in comparison with mine than they appear from the figures. Their percentages are from deaths that occurred in the Wisconsin General Hospital in the twelve months under review of any patients who had, at any time in the same period, received anæsthetics administered by the anæsthetic department. This naturally must have increased their death figures to a certain extent. Assuming that I am an average Australian anæsthetist, the discrepancy points to the ideal at which we have to aim in our anæsthetic services, a fact which was so ably stressed by Gilbert Brown in his Embley Memorial Lecture of this year.<sup>(3)</sup>

Tables V, VI and VII give more details concerning the deaths due to cyclopropane, and require little comment.

TABLE V.

Time of Occurrence of Death following Use of Cyclopropane.	Deaths.	
	Number.	Percentage.
During operation .. .. .	1	2.5
On day of operation .. .. .	9	22.5
One to three days after operation .. .. .	8	20.0
Four to seven days after operation .. .. .	10	25.0
Second week after operation .. .. .	7	17.5
Three to four weeks after operation .. .. .	5	12.5

TABLE VI.

Deaths under Cyclopropane Anæsthesia, according to Type of Risk.

Class of Risk.	Number of Deaths.
A .. .. .	1
B .. .. .	5
C .. .. .	25
D .. .. .	6
DD .. .. .	3

TABLE VII.

Analysis of Causes of Deaths During and After Cyclopropane Anæsthesia.

Cause.	Number of Deaths.
Surgical shock .. .. .	15
Toxæmia .. .. .	6
Coronary occlusion .. .. .	2
Myocardial failure .. .. .	8
Hæmorrhage .. .. .	1
Anæsthetic .. .. .	1
Carcinoma .. .. .	3
Intestinal obstruction .. .. .	1
Hepatic failure .. .. .	1
Accident .. .. .	1
Meningitis .. .. .	1

Table VII is inserted for what it is worth. It is obvious that an anæsthetic factor must have been present in some of the surgical shock group. I have, however, endeavoured to group the causes under what appeared to be, on the evidence, the preponderating cause.

The anæsthetic death was the one that occurred "on the table".



It was a case of a second-hand thyreoid with moderate thyreotoxicosis. Sub-basal anæsthesia was secured by "Avertin", with good but not profound narcosis, and cyclopropane was administered through a Leech gas-way. Thirty minutes after the beginning of the anæsthetic and twenty minutes after the first incision was made the patient suddenly collapsed. The pulse rate just before collapse was 120 per minute. Breathing ceased and the pulse disappeared almost synchronously. Intubation was resorted to, and the whole gamut of restorative measures was carried out, including opening of the abdomen and heart massage through the diaphragm, but there was no flicker of response.

The surgeon sympathetically talked of reflex vagal shock from the particular stage of the operation at which the collapse occurred; the pathologist who carried out the *post mortem* examination found an hypertrophied thymus gland; but I feel fairly confident that this was a death from overdosage with cyclopropane, probably with ventricular fibrillation.

The accident death in Table VII was that of an old woman with auricular fibrillation and gross congestive failure.

This patient inconveniently developed a strangulated hernia. This had been present for some hours prior to operation, and she had almost reached the stage of faecal vomiting. The stomach was inadequately washed out before the anæsthetic. The operation was performed under cyclopropane and oxygen anæsthesia solely, and she stood it well. Instead of being kept in the operating theatre until full consciousness returned, she was hurried off to her ward in charge of a junior nurse. The inevitable huge vomit occurred in the lift, and by the time the surgeon and I reached the ward her lungs were full of gastric contents.

This was an accident which should not have happened.

The final table is an attempt to give you an idea of the operations performed in the cyclopropane series with the deaths that occurred and their percentage for the particular operation.

TABLE VIII.

Operation.	Number of Cases.	Number of Deaths.	Percentage of Deaths.
Thyreoidectomy .. .. .	41	3	7.3
Thoracoplasty .. .. .	7	2	28.6
Intracranial operation .. .. .	16	2	12.5
Gall-bladder and duct operations .. .. .	50	7	14.0
Amputation of extremities .. .. .	3	2	66.6
Laminectomy .. .. .	5	2	40.0
Abdomino-perineal operation .. .. .	3	2	66.6
Operations for:			
Bowel carcinomata .. .. .	9	2	22.2
General peritonitis .. .. .	3	2	66.6
Fothergill operation .. .. .	26	1	4.0
Other gynaecological operations .. .. .	108	—	—
Rib resection .. .. .	6	1	16.6
Prostatectomy .. .. .	4	1	25.0
Operation for osteomyelitis .. .. .	8	1	12.5
Operation for intestinal obstruction .. .. .	3	2	66.6
Other abdominal operations .. .. .	105	5	5.0
Liver abscess drainage .. .. .	2	1	50.0
Gastrectomy .. .. .	7	2	28.6
Dental operations .. .. .	58	—	—
Mastectomy .. .. .	17	—	—
Lobectomy .. .. .	1	—	—
Other operations (ear, nose and throat, orthopaedic, ophthalmological & others) .. .. .	294	2	0.7

This table requires some comment. The deaths due to thyreoidectomy include the death on the operating table already commented on. In another case in this group the duration of operation was

one and three-quarter hours. I feel sure that if I had advised the surgeon to stop at the removal of one lobe the result would have been different.

The two deaths during thoracoplasty both occurred in my early experience with cyclopropane. In these cases I was misled by the apparent excellent clinical condition of the patient and did not take enough notice of rising pulse rate and falling pulse pressure. In other words, I failed to warn the surgeon when the safety margin was reached and allowed too many ribs to be removed.

The two patients who died as a result of intracranial operations had pituitary tumours.

The two deaths occurring as a result of amputation of an extremity included that of a patient suffering from severe shock from a mutilating accident, and another patient who underwent disarticulation through the hip joint for a sarcoma of the head of the femur. This latter case also occurred in my early experience with cyclopropane, when I did not fully appreciate the "pseudo-shock",<sup>(4)</sup> mentioned later, which is due to the sudden withdrawal of a rich oxygen mixture. I feel that this was a factor in the death under discussion.

The death in the Fothergill operation group was due to a coronary occlusion and occurred in the second week of the post-operative period.

The first death in the last group was that of a patient with mastoiditis, who died of meningitis, and the second was that of a patient with carcinoma of the tongue, whose lingual artery was tied, and who died of cachexia.

#### Conclusions.

From the foregoing I have concluded that, at any rate in my hands, cyclopropane is not the complete answer to the anæsthetist's prayer; but in the light of my experience with this anæsthetic agent, I should not like to be without it in certain cases. To mention a few: in chest surgery I think it is the ideal general anæsthetic agent we possess today, provided that the endotherm is not being used; when supplementary anæsthesia is necessary in long-drawn-out intracranial operations, cyclopropane administered through either a Leech gas-way or an endotracheal catheter is of great value; for the severely shocked patient or the poor anæsthetic risk cyclopropane has to be seriously considered, provided it has not to be pushed to the point of high concentrations. And so the list can be extended.

That cyclopropane has largely replaced ethylene in many centres is true; that it will encroach still further on the ethylene field in the future is, I think, certain. That it will never replace nitrous oxide is equally certain. I think cyclopropane and nitrous oxide must be considered complementary to one another. Woodbridge,<sup>(4)</sup> of the Lahey Clinic, recommends a mixture of nitrous oxide (six parts), cyclopropane (one part) and oxygen (four parts). Such a mixture, he holds, diminishes the faults of

both, namely, the relative oxygen lack of the average nitrous oxide and oxygen mixture on the one hand and the toxicity of cyclopropane in high concentrations on the other. I have lately been using mixtures more extensively; but I do not think that one can hold fast to any rigid formula such as the above. The proportions must be varied according to the needs of the individual case. Such mixtures may be the solution of the problem of anaesthesia in thyroid surgery. One at least of my fatalities in this group would have been avoided, I feel sure, by their use.

Increased bleeding is so persistently attributed to cyclopropane by some surgeons that some mention must be made of it. Waters's<sup>(5)</sup> present conception of it appears to be as follows: (i) a high oxygen content in the gas mixture makes hæmorrhage more visible and increases capillary dilatation; (ii) cyclopropane may cause an increased capillary blood flow.

The mixture of nitrous oxide, cyclopropane and oxygen may therefore also diminish the bleeding factor.

Waters also draws attention to what he terms "pseudo-shock", due to the sudden withdrawal of a rich oxygen mixture. This, in my own experience, is very real, and is particularly noticeable in the long-drawn-out operation under cyclopropane in which a fair amount of surgical shock has occurred. A gradual dilution of the mixture with air in the later stages of the anaesthesia or administration of oxygen in gradually diminishing concentrations in the immediate post-operative period appears to be the solution of this difficulty.

With regard to the present position of cyclopropane in gas anaesthesia, my own feelings are these: if nitrous oxide and oxygen will give the necessary depth of anaesthesia for the particular surgical procedure without jeopardizing organic function by relative oxygen lack, use it; if increased depth of anaesthesia or oxygenation is indicated, use cyclopropane with or without nitrous oxide, according to the circumstances; if the danger signals of cyclopropane overdosage appear, namely, pronounced bradycardia, tachycardia or irregularity of the pulse, dilute the mixture and supplement it with ether, "Vinesthene" or, if you have sufficient courage, chloroform.

#### Acknowledgements.

My thanks are due to the surgeons who encouraged me in the use of cyclopropane, and to the sisters who responded in the providing of post-anaesthetic information.

#### References.

- <sup>(1)</sup> B. C. Leech: "Pharyngeal Bulb Gas-Way for Cyclopropane Anaesthesia", *Anaesthesia and Analgesia*, January-February, 1937.
- <sup>(2)</sup> Anesthetic and Surgical Statistics, compiled by the Department of Anesthesia, Wisconsin General Hospital, January 1, 1934, to January 1, 1935.
- <sup>(3)</sup> G. Brown: Embley Memorial Lecture: "The Evolution of Anaesthesia", *THE MEDICAL JOURNAL OF AUSTRALIA*, February 11, 1939.
- <sup>(4)</sup> P. D. Woodbridge, Lahey Clinic, Boston: Personal communication.
- <sup>(5)</sup> "Proceedings of the American Society of Anesthetists, Incorporated", Annual Meeting, December 8, 1938.

#### ANÆSTHESIA FOR SPECIALIST NOSE AND THROAT SERVICES.<sup>1</sup>

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In this paper I do not hope to introduce anything new, but rather to review my attempts to meet the requirements of the ear, nose and throat surgeons, and so to provoke criticism and discussion.

When first I came into contact with these surgeons I found that there was a marked prejudice amongst them in favour of local anaesthesia. They dissected tonsils, removed septa, operated upon antra, and passed bronchoscopes under local anaesthesia. "Gas" anaesthesia was unknown to them, and indeed was looked upon as useless for their operations. The small amount of bleeding that took place with local anaesthesia outweighed all considerations of the patients' feelings. It was only when the surgeons realized that fatal accidents could occur with local anaesthesia in the nose, throat and larynx that they began to weigh the pros and cons and became aware that local anaesthesia had definite defects. They realized that reactionary hæmorrhage was more common; that in the case of tonsillectomy the risk of pulmonary abscess was increased; that in some cases complete operation was impossible; and, last, but by no means least, that the patients not only did not like being conscious during the operation, but often considered that they had received poor value for the fee charged when operated upon under local anaesthesia.

When the nose and throat surgeons had been persuaded that local anaesthesia was not in the best interests of their patients or themselves, the next problem was to provide a general anaesthetic that would be satisfactory from the surgeon's point of view and at the same time be safe for the patient. The most important requirements for the surgeon are: (i) a minimum of bleeding; (ii) absence of cyanosis, to enable him to work in deep cavities; and (iii) absence of excess anaesthetic vapours in the field of operation. The first and second requirements were met by chloroform anaesthesia; but from the standpoint of the safety of the patient this was ruled out of court, especially as adrenaline is frequently employed by the surgeon, and the combination of adrenaline and chloroform is dangerous.

As the types and methods of anaesthesia vary with the operations to be performed, I propose to discuss them under the headings of the recognized operations of the ear, nose and throat specialists.

In the pharynx, by far the commonest operation is tonsillectomy, and, of course, in these days the

<sup>1</sup> Read at the Congress of the Australian Society of Anaesthetists at Melbourne on April 4, 1939.



method of operation is almost invariably that of dissection. Intraparyngeal anaesthesia via the tongue-piece of the gag has never impressed me as being a very efficient method. With a strong adult patient the difficulty in obtaining a sufficient concentration of ether to maintain satisfactory anaesthesia is well known; and if that concentration is obtained, the surgeon, as well as the patient, is liable to be anaesthetized. My various attempts to overcome these shortcomings have been to use the following anaesthetic agents: (i) "Avertin" supplemented by ether; (ii) "Evipan Sodium" and "Pentothal Sodium", injected intravenously; and (iii) pernasal intubation of the larynx, and the Magill technique of endotracheal inhalation of ether. In regard to "Avertin", I consider that the delayed return of reflexes is unwise in tonsillectomy, though the operation is easy, the bleeding being slight. Intravenous anaesthesia, I find, has to be pushed rather far in order to abolish pharyngeal reflexes, and if difficulty is encountered in the operation it may be necessary to change to ether. My personal preference is for pernasal intubation, for by its use satisfactory anaesthesia is easily maintained and the anaesthetic vapours can be removed from the field of operation. This last fact is much appreciated by the surgeon called upon to perform a series of tonsillectomies.

I find that the majority of patients for tonsillectomy are very good risks, and that ether is satisfactory; but when the risk is poor, particularly in the presence of a chest lesion, I use nitrous oxide under pressure delivered by the "Austox D.M." or the "McKeesson Nargraf" machine, with the Magill tube introduced through the nose. I prefer the nasal route to the oral, as the catheter lies at the back of the pharynx, behind the posterior pillars of the fauces, where it does not hinder the surgeon, and the larynx is readily packed off so that a gas-tight system is ensured. Furthermore, the catheter runs much less risk of being kinked than with oral intubation. These remarks apply equally to the administration of ether by the same method.

The other common operation in the pharynx is the opening of a peritonsillar abscess. I am afraid that few anaesthetics for this procedure are administered by specialist anaesthetists; but when it falls to my lot to participate in this operation I use nitrous oxide given with the nasal mask, as for dental extractions. Protection of the lungs by packing and rapid return of consciousness for the evacuation of pus from the mouth are thus ensured.

Turning now to operations on the nose and accessory sinuses, I find that submucous resection of the nasal septum has passed out of favour with most surgeons for whom I give anaesthetics, and that the majority of operations are extensive pansinus procedures. Many of these patients have associated chest lesions, either chronic bronchitis or frank bronchiectasis. In these cases I invariably use the Magill inhalation technique, the tube being introduced, of course, through the mouth; and I pack the pharynx as well as the post-nasal space

with gauze lubricated with liquid paraffin. In this way it is possible for the surgeon to operate in comfort and with the patient at a very light level of anaesthesia. When working with surgeons to whose work I am accustomed, I expect the patient to have regained consciousness within a very short time of the conclusion of the operation. Endotracheal inhalation anaesthesia has many well-known advantages, from the point of view of both the surgeon and of the anaesthetist; but in my opinion one of the greatest is the fact that the anaesthesia can be maintained at a much lighter plane than with endotracheal insufflation, provided that movement of the catheter in the larynx is avoided.

I now propose to put forward opinions that I am sure will not meet with the approval of some who are present. In my opinion the type of chest condition which is commonly associated with chronic sinusitis is not adversely affected by the use of ether. The cases in which I give nitrous oxide are those in which a tuberculous lesion is suspected, or in which there has been a recent acute exacerbation in the chest. The patient with the chronic cough and sputum, commonly associated with chronic sinusitis, I consider has become so immune to his own organisms that the risk of respiratory infection following ether anaesthesia is little, if at all, greater than for the healthy patient. The patient with frank bronchiectasis is always a difficult anaesthetic problem. The chest is usually so irritable that it is impossible to anaesthetize the patient with ether, and under nitrous oxide anaesthesia cyanosis is difficult to avoid, owing to the diminished lung capacity. Moreover, when the struggle is over it is doubtful whether the patient will have benefited to any marked degree either by the operation or the anaesthetic. It is usually a case of "locking the stable door after the horse has bolted".

Though I stated previously that the operations on the nasal septum had passed out of favour, nevertheless I have given anaesthetics in a small series of such cases with one surgeon, using "Pentothal Sodium" as the anaesthetic agent. I have found this drug preferable to "Evipan Sodium", as the sneezing reflexes seem to be abolished to a much greater degree. The doses varied from 12 to 16 cubic centimetres, and the duration of the operation was approximately ten minutes. The patients were all young females who had refused local anaesthetics and objected to ether. As might be expected in such cases, they expressed great satisfaction at the absence of post-operative sickness. In this series I was fortunate, inasmuch as all patients, though females, had sufficiently large veins.

In surgery of the ear there are two distinct classes of patients. First, there are the patients with acute *otitis media* and acute mastoiditis, with the various acute complications; and secondly, there are the patients with chronic mastoiditis and its complications. In the former class we are dealing with patients with very recent respiratory infections,



and I believe that many of these patients are given ether when nitrous oxide is indicated. Working, as I do, at the Eye and Ear Hospital, I see and hear of many children with acute mastoiditis who are given ether anaesthetics and later develop chest infections; and yet I find it difficult to persuade the resident medical staff that these infections are easily avoidable by the use of nitrous oxide.

If in a case of acute mastoiditis I believe that the chest is above suspicion and that ether is indicated, I refrain, nevertheless, from the use of endotracheal anaesthesia, and prefer a pharyngeal airway with an ether channel if it is necessary to keep away from the operative field. Extremely light anaesthesia, of course, is all that is required.

In the chronic cases the choice of anaesthetic depends on the usual factors, unless a cerebral complication is present; then my preference is for nitrous oxide, as I believe that the patient is much more under control for the emergencies that are apt to arise as a result of the sudden disturbances of intracranial pressure associated with the opening of cerebral abscesses.

My experience of surgery of the larynx, apart from the usual biopsies, has been limited to a few cases of laryngectomy, laryngo-fissure and implantation of radium about the larynx. In these cases the success of the operation seems to depend on the complete avoidance of respiratory complications. My practice has been to use basal hypnotic doses of "Avertin" (0.08 gramme per kilogram of body weight), followed by the endotracheal administration of nitrous oxide; the exact technique depends on whether the tracheotomy was performed at the beginning of the operation or toward the end. But it is not enough to administer to these patients a satisfactory anaesthetic; efficient after-treatment is imperative. They should be kept in a steam tent for forty-eight hours and given "Carbogen" regularly, and the tracheotomy opening must be protected from any possible drainage that may occur from the wound. If these precautions are not taken, bronchopneumonia is certain to supervene.

I wish now to deal briefly with anaesthesia for endoscopy. As far as bronchoscopy in adults is concerned, it is best carried out under local anaesthesia; this procedure, however, is not devoid of risk, for several deaths have taken place under local anaesthesia with cocaine and "Pantocaine". However, in all the fatalities due to "Pantocaine" a severe abnormal condition was present, which would have rendered any manipulation dangerous. It therefore appears that "Pantocaine", used carefully, is the best local anaesthetic agent available for bronchoscopy in adults. Attempts to use basal narcosis are very apt to fail if safe amounts of drug are used, and to endanger the patient if pushed to the stage of satisfying the surgeon. In small children the problem is a difficult one, and the only solution generally appears to be the use of chloroform given via the bronchoscope. This procedure, carried out in the darkness of a fluoroscopic screening room, can be anything but pleasant; but,

in view of the almost invariably associated chest abnormality, and the fact that anaesthesia has to be maintained through one bronchus, no other inhalation anaesthetic is possible.

For oesophagoscopy I have tried intravenous anaesthesia; but I have had to push it to the limit to obtain relaxation of the upper sphincter of the oesophagus, and I consider it to be quite unsuitable. Endotracheal insufflation of ether, by means of a firm gum-elastic catheter, seems to be the most satisfactory form of anaesthesia.

Finally, I should like to refer to premedication in nose and throat cases. My practice has been to use as little premedication as possible, as I try to have the patient out of the anaesthetic as quickly as possible. Not only does this prevent the inhalation of foreign material, but it also prevents the swallowing of large amounts of blood, which nauseate the patient. When ether is the anaesthetic agent chosen I use atropine alone or possibly with "Nembutal", 0.1 gramme (one and a half grains), given one hour before operation. When nitrous oxide is to be used, I give 0.01 to 0.02 gramme (one-sixth to one-quarter of a grain) one hour before operation. The type of premedication is determined by the length of operation that is anticipated, so that the hypnotic effect will have passed off by the end of the operation.

In conclusion I would say that after experimenting with rectally and intravenously administered anaesthetics, I still find ether the first choice in anaesthesia for specialist nose and throat services.

#### ANÆSTHESIA IN ACUTE INTESTINAL OBSTRUCTION.<sup>1</sup>

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THE administration of an anaesthetic to a patient suffering from acute intestinal obstruction is fraught with many difficulties and dangers. The mortality rate in these cases is high and does not appear to have decreased very much in spite of new anaesthetics and new techniques. At the Adelaide meeting of the Australasian Medical Congress (British Medical Association) in 1937, the Section of Anaesthetics discussed the statistical records of anaesthetic fatalities of the principal hospitals in Australia over a period of five years. In these the number of deaths among patients suffering from intestinal obstruction is high, as will be seen from the figures shown in Table I.<sup>(1)</sup>

There were 121 fatalities in these hospitals, of which 13 occurred in cases of intestinal obstruction—more than 10%. These deaths were attributed to the inhalation of vomitus or to shock.

<sup>1</sup> Read at the annual meeting of the Australian Society of Anaesthetists on April 3, 1939, at Melbourne.

TABLE I.

Hospital.	Number of Anæsthetic Fatalities Recorded.	Number of Cases of Intestinal Obstruction.
Adelaide <sup>64</sup>	44	6
Melbourne	28	3
Alfred	22	2
Prince Henry	7	1
Royal Prince Alfred	20	1
	121	13

In order to illustrate the average condition of these patients and the manner in which death usually takes place, the following four records are given.

#### Reports of Cases.

**CASE I.**—J.H.M., aged fifty-six years, had suffered from intestinal obstruction for several days, and for the previous sixteen hours had been vomiting faecal smelling matter. He was cyanosed, his eyes were sunk and his pupils dilated. The skin was cold and sweating. His urine was being passed involuntarily. His pulse rate was 150 beats and his respiration rate 48 per minute. It was impossible to be sure of the blood pressure, but it was estimated as approximately 70 millimetres of mercury systolic and 45 diastolic. Ethylene and oxygen were administered and the abdomen was being shaved when within two minutes of the commencement of the administration the patient's breathing became shallow, and without any other warning there was a projectile vomit of over three pints of faeculent fluid. Respiration ceased; the patient became deeply cyanosed and died.

**CASE II.**—Mr. E., aged eighty-one years, was a very frail old man, whose hernia had been strangulated for some twelve hours. He had frequent hiccup, but no vomiting. His pulse rate was 96 beats and his respiration rate 24 per minute. He had been given an injection of 11 milligrammes (one-sixth of a grain) of morphine and 0.65 milligramme (one one-hundredth of a grain) of atropine. Ethylene and oxygen were given, and four minutes later, before the patient was fully anesthetized, projectile vomiting of coffee ground material occurred. The mask was removed and the mouth and throat were cleared by suction; and later the anæsthetic was resumed. A herniotomy was performed, which required thirty-five minutes. The condition of the patient at the end of the operation appeared to be good. His pulse was of fair volume, the rate being 108 per minute; the respiration rate was 28 per minute. His colour was good, on account of the high percentage of oxygen employed. He was returned to bed; his pulse rapidly became weaker and his respiration more rapid, and his colour became poor. One hour after operation he died.

**CASE III.**—J.R., aged seventy-one years, suffered from intestinal obstruction and had hiccup and vomiting. His pulse was irregular; systolic blood pressure was 110 and the diastolic pressure 80 millimetres of mercury. A spinal anæsthetic of 12 cubic centimetres of light "Percaïne" solution was injected and the patient was turned on his face. Immediately copious vomiting occurred, about three pints being lost. The patient appeared to be suffering more severely from shock and lost consciousness; respiration ceased, his pulse gradually became weaker and he died.

**CASE IV.**—H.A., aged seventy-six years, had a strangulated hernia and had been vomiting for two days. Nitrous oxide and oxygen anæsthesia was administered and a herniotomy was performed. During the operation he vomited faecal matter, and at the end of the operation he was cyanosed and suffering from shock. He died twenty minutes later.

From such records as these a typical picture may be drawn. The patient is suffering from shock; the skin and extremities are dusky, cold and sweating. The features are pinched and the eyes sunken, on account of the dehydration. The pulse is rapid and the blood pressure low, indicating that the circulatory mechanism is unable to withstand the strain. The abdomen is distended and the stomach is filled with highly toxic fluid contents. Hiccup may be present and sudden vomiting of a projectile type may occur without warning. In the urine of these patients there is a diminution or absence of chlorides.

#### Difficulties of Anæsthesia in Acute Intestinal Obstruction.

The difficulties of administration of an anæsthetic to such a patient are obvious, especially as deep anæsthesia may be required in order to provide the relaxation demanded by the surgeon. The textbooks on anæsthesia usually devote a paragraph to the subject of anæsthesia in acute intestinal obstruction; but they are not particularly helpful, as the following quotations will show.

A patient suffering from intestinal obstruction or from generalized peritonitis has his stomach and intestines full of highly infective fluid. Reverse peristalsis may set in merely as the result of the inhalation, or later from handling the contents of the abdomen, and the faeculent fluid gushes up the œsophagus with little or no warning. Since vomiting in these cases may occur even in deep anæsthesia, when the cough reflex which is the normal sentry to the entrance of the larynx is abolished, the dangers of insufflation are very real indeed. Personally the author prefers to wash out the stomach before beginning to induce anæsthesia in these cases, but some surgeons believe that the shock of this procedure outweighs the advantages.<sup>65</sup>

Washing out the stomach prior to induction (though traditional) is of dubious value. Such patients should be anesthetized with the head lowered, and preferably by the endotracheal technique, with a wide-bore catheter and exhaling valve, and with the pharynx packed off.<sup>66</sup>

... in intestinal obstruction with its possible inhalation of vomitus . . . local or regional anæsthesia is often desirable for the relief of the surgical emergency.<sup>67</sup>

The theoretical objection against using spinal block for the latter condition (mechanical obstruction) is the possibility of rupturing a gangrenous loop of bowel from increased peristalsis. The validity of this objection has recently been questioned, and there is no doubt that spontaneous reduction of hernias frequently occurs after the induction of spinal analgesia. On the other hand it must be remembered that a sudden massive action of the bowels may cause collapse and even death in elderly patients who are gravely ill. It is the opinion of the author and others that spinal analgesia should not be used in such cases.<sup>68</sup>

Spinal block is thought by some to be the best method, but in the opinion of the author and others the endotracheal technique with a gauze pack or inflated cuff is safer, as no further lowering of blood pressure occurs and the inspiration of septic material is avoided.<sup>69</sup>

If the intestinal obstruction is known to be due to a strangulated hernia, the operation can frequently be performed successfully under local analgesia.<sup>70</sup>

This author also recommends a powerful suction pump and the passing of a stomach tube, which is maintained in position throughout the operation "when anæsthesia is progressing smoothly".



It should be possible to evolve a more definite plan to combat the dangers of this condition and to act as a guide to those who have to deal with such an emergency. In order to cope with these difficulties the writer offers recommendations. These recommendations are the outcome of personal experience both before and after the papers of Wangenstein and Paine<sup>(9)</sup> had been read and the result of their methods observed in actual use.

#### General Considerations.

The anæsthetic fatalities reported in these cases appear to have been usually caused either by inhalation of vomitus or by shock. But there is another factor which must be taken into consideration: that the death may be due, in part at least, to chemical changes produced by persistent vomiting. Vomiting causes dehydration, loss of chlorides and alkalosis. Gamble and Ross<sup>(11)</sup> have shown that it is possible to maintain alive for long periods dogs in which intestinal obstruction had been produced, by the simple remedy of injecting large quantities of sodium chloride solution into the gut below the obstruction.

As early as 1912 it was shown by Hartwell and Hoguet<sup>(12)</sup> that the lives of dogs with duodenal obstruction could be prolonged from a few days to as long as three weeks by the subcutaneous administration of saline solution.

The obvious method of approach, therefore, seems to be the prevention of vomiting, the treatment and prevention of shock and the overcoming of dehydration and alkalosis. This means primarily that better preparation is required than is usually given in this type of case. As these procedures will occupy a certain amount of time, a new conception of the whole treatment of intestinal obstruction is involved. Immediate operation should be abandoned and replaced by a delayed operation carried out after the patient's condition has improved.

#### Preoperative Treatment.

It has been pointed out by Wangenstein<sup>(10)</sup> that in order to lessen the chance of vomiting during anæsthesia it is necessary to empty the stomach. This should not be done by the passage of a stomach tube and washing out of the stomach, as this causes further shock and is merely a temporary measure; the stomach will continue to fill again with fluid regurgitated from the small intestine. A small duodenal tube should be inserted and connected to an apparatus which produces continuous low pressure suction. The stomach will be emptied, and kept empty, while at the same time the abdominal distension will rapidly decrease. The tube should be kept in place during the operation and for the early part of the post-operative period.

Shock should be treated by the administration of sufficient morphine to relieve pain, by the application of warmth by means of the shock cradle and by the administration of fluids. The only method by which fluids can be rapidly introduced into a patient who is vomiting is intravenous infusion. Intra-

venous infusion of glucose saline solution by the constant drip method should be begun promptly. This will also overcome the dehydration and supply the necessary chlorides. The patient should, if possible, be taken to the operating theatre in his bed, to which are attached the apparatus for suction and infusion. This will eliminate much disturbance and lifting of the patient.

#### The Operation Itself.

The extent of the operation has a great influence on the mortality and also on the anæsthetic mortality. The following quotation from a paper by Wangenstein<sup>(10)</sup> is worthy of reproduction.

... the question always presents itself as to whether the surgeon should content himself with relieving the obstruction or whether he should also remove the obstructing agent. The experience of abdominal surgeons over a period exceeding half a century speaks with emphasis upon this point. Operations of election are hazardous in acute intestinal obstruction and can be applied with safety only to the early case. The late obstruction will not tolerate an operation of great magnitude. Considerable manipulation of the obstructed bowel commands much risk for the patient. Anastomotic operations in the presence of acute obstruction are decidedly unsafe. The essentials of a well-planned operative procedure demand that: (i) The sterility of the peritoneal cavity be preserved inviolate. Visible spillage or contamination when operating for obstruction are synonymous with failure. The operation must be done *aseptically*. (ii) The operation of least magnitude which will well undo the injurious effects of obstruction be performed. (iii) The immediate restoration of intestinal continuity be a matter of secondary concern except in those instances in which intestinal fistula of itself would prove dangerous. ... I have the firm conviction that most patients with late simple obstruction whose bowel wall is viable without impaired permeability have a good chance of recovery following an *aseptic* decompression.

#### The Anæsthetic.

In choosing the anæsthetic the following points should be considered: (i) The drugs used should be as little toxic as possible. (ii) Any general anæsthetic selected should allow rapid recovery of the reflexes, so that vomitus will not be inhaled. (iii) The drugs should not lower the blood pressure to any great degree. (iv) Although good relaxation is essential when an exploration of the abdomen is undertaken, a major exploration is seldom required or permissible; decompression of the distended bowel is the sole essential in the majority of cases.

#### Methods of Anæsthesia Available.

##### Local Anæsthesia.

The advantages of local anæsthesia are the following: its toxicity is very small, it does not cause shock, the cough reflex is not impaired, there is no interference with metabolism, and the duration of anæsthesia makes little or no difference. The disadvantages are that the patient is conscious and that it may be difficult or impossible to produce anæsthesia sufficient for major exploration of the abdomen, when that is necessary. Local anæsthesia is the anæsthetic of choice for intestinal obstruction caused by a strangulated hernia. It is the only form of anæsthesia permissible when the patient is

in *extremis*; in such cases a small incision may be made and the first distended loop of bowel found should be opened and nothing further done. If this method is employed some of the patients will recover, whereas a bigger operation under general anaesthesia will mean almost certain death for the patient. Local anaesthesia may be combined with gaseous anaesthesia for patients who require more searching exploration, as the duration of the unconsciousness may be curtailed and the percentage of oxygen increased.

**Spinal Anaesthesia.**—Spinal anaesthesia provides better relaxation than any other form of anaesthesia. It has the advantage that the cough reflex is retained, so that inhalation of vomitus is prevented. It may be used for patients whose systolic blood pressure is over 100 millimetres of mercury, provided that their general condition is fair. It is not advisable for very weak or debilitated patients, as in some cases there is a considerable fall in blood pressure. It may also cause a copious evacuation of the bowels or vomiting, with resultant shock.

#### Inhalation Anaesthesia.

**Chloroform.**—Chloroform should never be used, as it has been found by experience that it is particularly dangerous to this type of patient. Its toxic action on the liver alone should preclude its use.

**Ether.**—Ether has the advantages that it will produce good relaxation, that it is always available and that it is cheap. But its disadvantages are numerous: coughing, vomiting and straining may occur during the induction, it is eliminated slowly, and it is frequently followed by vomiting.

**The Gaseous Anaesthetics.**—Nitrous oxide, ethylene and cyclopropane all have the following advantages: they are non-toxic, they cause no irritation to the respiratory mucous membrane, they are eliminated rapidly, the cough reflex is quickly regained and they cause little post-operative vomiting. They have, however, the disadvantage that with them it is less easy to produce relaxation than with ether. Cyclopropane provides the best relaxation; but at times this gas will fail to cause relaxation of the abdominal muscles sufficient for exploration in a muscular man. It may, however, be supplemented by being combined with local infiltration anaesthesia or by a minimal addition of ether.

#### Intravenous Anaesthesia.

Intravenous anaesthesia is contraindicated for patients who are very seriously ill; it causes some fall of blood pressure, and in fact seems to have no advantage for operation on this type of patient, except that it is seldom followed by vomiting.

#### Endotracheal Methods of Anaesthesia.

Endotracheal methods of anaesthesia either with the gases or with ether have the great advantage that it is possible to prevent the inhalation of vomitus, once the tube has been introduced and

packing placed round it. The very serious disadvantages are that vomiting may, and frequently does, occur before the patient is sufficiently relaxed for the tube to be introduced; and the attempts to intubate may be an additional cause of vomiting.

#### Summary.

1. The dangers of anaesthesia for patients suffering from acute intestinal obstruction are discussed.

2. Means are suggested for lessening this danger.

3. Better preparation of the patient is advised, especially continuous duodenal suction and the introduction of saline solution by continuous intravenous drip.

4. The necessity for delaying the operation for this preparation is stressed.

5. It is suggested that simple drainage of the bowel is usually sufficient and that this is much safer than exploration.

6. The various methods of anaesthesia are discussed and the use of local anaesthesia is recommended whenever possible.

#### References.

- <sup>1</sup> G. Brown: "Anaesthetic Fatalities at the Adelaide Hospital, January 1, 1932, to December 31, 1936", *THE MEDICAL JOURNAL OF AUSTRALIA*, Volume I, Number 24, June 11, 1938, page 395.
- <sup>2</sup> G. Brown: "Report on Anaesthetic Fatalities in the Adelaide Hospital", *Medical and Scientific Archives of the Adelaide Hospital*, Number 17, 1937.
- <sup>3</sup> S. Ross and H. P. Fairlie: "Handbook of Anaesthetics", Fourth Edition, 1935, page 209.
- <sup>4</sup> The Anaesthetic Staff of the Alfred Hospital, Melbourne: "Practical Anaesthesia", 1932, page 101.
- <sup>5</sup> *Ibidem*, page 169.
- <sup>6</sup> C. L. Hewer: "Recent Advances in Anaesthesia and Analgesia", Second Edition, 1937, page 153.
- <sup>7</sup> *Ibidem*, page 221.
- <sup>8</sup> *Ibidem*.
- <sup>9</sup> O. H. Wangenstein and J. R. Paine: "Treatment of Acute Intestinal Obstruction by Suction with the Duodenal Tube", *The Journal of the American Medical Association*, Volume C1, Number 2, November 11, 1933, page 1532.
- <sup>10</sup> O. H. Wangenstein: "Rationalizing Treatment in Acute Intestinal Obstruction", *Surgery, Gynecology and Obstetrics*, Volume LXIV, Number 2a, February 15, 1937, page 273 *et sequentes*.
- <sup>11</sup> J. L. Gamble and S. G. Ross: "The Factors in the Dehydration following Pyloric Obstruction", *The Journal of Clinical Investigation*, Volume I, 1925, page 403.
- <sup>12</sup> J. A. Hartwell and J. P. Hoguet: "Experimental Intestinal Obstruction in Dogs, with Special Reference to Cause of Death and Treatment by Large Amounts of Normal Saline Solution", *The Journal of the American Medical Association*, Volume LIX, July 13, 1912, page 82.

## Reviews.

### ACTINOTHERAPY AND DIATHERMY.

E. B. CLAYTON states in his preface that he has written his "Actinotherapy and Diathermy" for students who are working for the second part of the electrotherapy examination of the Chartered Society of Massage and Medical Gymnastics.<sup>1</sup> This makes us diffident in offering any adverse criticism, as it is impossible to be sure that it is not the form of the examination that should be criticized rather than the book. The author deals at fair length with ultra-violet and infra-red radiation and diathermy,

<sup>1</sup> "Actinotherapy and Diathermy for the Student", by E. B. Clayton, M.B., B.Ch., 1939. London: Baillière, Tindall and Cox. Demy 8vo, pp. 190, with illustrations. Price: 7s. 6d. net.



and very briefly with the condenser field and inductance type of short wave radiation. In this last section he fails to describe how the heating effects on tissues differ from those of long-wave diathermy.

In the main part of the book the author follows the usual method of describing the physics of the current with which he is dealing, the structure of the various kinds of machines used, the physiological effects, and the technique of application. He seems to spend more space than is necessary on the technical description of apparatus (though possibly the examination demands this) and not quite enough on how to use it. The book is written in a plain, straightforward style, without any frills or high-lights, and it must be counted to him for righteousness that we do not remember being once injured by stumbling against "armamentarium". It is well produced, with clear diagrams and an adequate index.

#### "THE DIABETIC A.B.C."

THE sixth edition of "The Diabetic A.B.C." by R. D. Lawrence, contains a radical alteration of the "line" scheme of diet which was first enunciated some years ago. The red portions of the lines have been changed so as now to contain 7.5 grammes of protein and 9.0 grammes of fat instead of 7.5 grammes of protein and 15.0 grammes of fat. This change, following upon the increase in value of the black portions from 5.0 grammes of carbohydrate to 10.0 grammes of carbohydrate which was made a few years ago, reflects the altering trend of modern opinion of the dietary management of the disease.

The reduction of the fat content of the red portions is an excellent move and renders the scheme easier of application to a greater number of patients. The sample menus explaining the line scheme have been altered and provide a simple exposition of the working of this dietary system.

Another welcome addition is an unweighed qualitative scheme of diet for mild cases, which should be of help in dealing with those patients whose condition is not such as to warrant a weighed restriction of food.

A brief but adequate account is given of zinc protamine insulin and insulin retard, and the essential differences in dietary balance and in symptoms of overdosage are mentioned.

This is an excellent book for patient and doctor, and provides a concise and satisfactory exposition of the modern methods of control of diabetes mellitus.

#### SINGING.

HAYDN HEMERY, a well-known teacher of singing at the Royal Academy of Music in London, has produced a small book entitled "The Physiological Basis of the Art of Singing". Although himself experienced in the value of the application of those methods which are based upon sound physiological knowledge, the author acknowledges his reference to the writings of such authorities as Sir Arthur Keith, V. E. Negus and others who have reported their studies of the mechanism of respiration, and of the larynx and the mode of development of various disorders of speech.

In a number of short chapters the mechanism of breathing and of laryngeal and throat action are described with sufficient anatomical data to render these processes clear to the beginner and to make logical the methods of breathing and of voice production which aim at economy of effort at the same time as maximum of control. There

is a short description of exercises necessary to develop the proper mode of breathing based upon the previous anatomical description.

In another chapter the author describes, with anatomical description and diagrams, how faulty efforts at voice production are brought about, and then he gives a similarly explained treatise on the correct process in singing.

Final chapters describe the psychological factors necessary for a successful approach to song and the study of emotion, words and dramatic expression.

The medical man must appreciate a work which may be of help in the understanding of those patients who come to their doctor for advice in vocal difficulties and disorders. He may be a little disappointed that this work does not contain a section written with a laryngologist standing by to tell of the voice and speech disorders medically encountered and to hear in turn of recommended exercises and methods of voice training likely to bring relief. From the medical point of view the utility of this work has perhaps been sacrificed for brevity. The doctor will want a book containing in greater detail a description of vocal exercises and of the physiological remedies which a singing teacher of experience will recommend in cases of vocal failure, hoarseness and tiring of the voice. On the other hand, the student of singing and other individuals who have to speak a lot, especially those who undertake platform work, will gain much from reading Mr. Hemery's little book. As a first edition this is a splendid effort. It is to be hoped that there will be subsequent editions, in which the disorders arising from the medical practitioner's experience will be more fully inquired into and the remedies in the way of exercises and correction of method of production will be more fully set out.

#### AN OPHTHALMOLOGY HAND-BOOK.

In "A Handbook of Ophthalmology" the authors, Humphrey Neame and Williamson-Noble, have admirably carried out their intention "to keep before their minds the fact that the book was intended for undergraduate students and general practitioners". The common disorders and diseases are described in a manner which would in most cases facilitate their diagnosis. The methods of treatment mentioned are, wherever possible, those that have been proved of value.

Two small points regarding operative treatment may be mentioned here, however. The treatment of epicanthus by the excision of an oval piece of skin from the bridge of the nose may not give the satisfactory results which the authors suggest. If unduly optimistic here, surely they go to the other extreme in reference to the results of treatment of pterygia when they state: "In most cases recurrence takes place, and repeated operations are necessary." Most oculists in this country consider that though sometimes they are disappointed when least expecting to be, yet as a rule one operation is adequate. Such an inaccurate statement is one more reason, if such is required, why oculists from the old country should visit their antipodean descendants. Some deeply laid plot is probably being prepared, however; otherwise why are English oculists concentrating so eagerly on bowling "googlies" with ivory balls to squinting children while their colleagues in Australia are satisfied with the inverted "E" test? The outstanding weakness in this book is its description of the fundus changes in arteriosclerosis. Surely the time has come when the simple alterations due to advancing years can be distinguished from those due to hypertension and arteriosclerotic changes usually associated with interference with renal function. No mention is made of that important early loss of transparency of vessel walls and the later appearance due to infiltration of the perivascular sheath. Apart from these deficiencies the book is one that is admirably suited for the student who is being introduced to ophthalmology.

<sup>1</sup> "The Diabetic A.B.C.: A Practical Book for Patients and Nurses", by R. D. Lawrence, M.A., M.D., F.R.C.P.; Sixth Edition; 1939. London: H. K. Lewis and Company Limited. Demy 8vo, pp. 71. Price: 3s. 6d. net.

<sup>2</sup> "The Physiological Basis of the Art of Singing", by H. Hemery, L.R.A.M.; 1939. London: H. K. Lewis and Company Limited. Demy 8vo, pp. 158, with 59 illustrations. Price: 10s. 6d. net.

<sup>3</sup> "A Handbook of Ophthalmology", by H. Neame, F.R.C.S., and F. A. Williamson-Noble, F.R.C.S.; Third Edition; 1939. London: J. and A. Churchill Limited. Medium 8vo, pp. 346, with 12 plates, containing 46 coloured illustrations and 143 text figures. Price: 13s. 6d. net.

## The Medical Journal of Australia

SATURDAY, JULY 29, 1939.

All articles submitted for publication in this journal should be typed with double or treble spacing. Carbon copies should not be sent. Authors are requested to avoid the use of abbreviations and not to underline either words or phrases.

References to articles and books should be carefully checked. In a reference the following information should be given without abbreviation: Initials of author, surname of author, full title of article, name of journal, volume, full date (month, day and year), number of the first page of the article. If a reference is made to an abstract of a paper, the name of the original journal, together with that of the journal in which the abstract has appeared, should be given with full date in each instance.

Authors who are not accustomed to preparing drawings or photographic prints for reproduction are invited to seek the advice of the Editor.

### THE PREVENTION OF POST-OPERATIVE PULMONARY COMPLICATIONS.

THE perfection of modern methods of anaesthesia and improvements in surgical technique and equipment have reduced the number of post-operative complications. Complications, however, still occur. It was formerly thought that nearly all pathological conditions arising in the lungs after surgical operation were due either to the anaesthetic agent *per se* or to the anaesthetist's lack of skill in the administration of a possibly harmless agent. There was a considerable amount of clinical experience and experimental work to support this view, but it did not explain all complications, particularly those following the use of local anaesthesia. Obviously the anaesthetist was not always to blame. Some years ago reference was made in these columns to a communication by Cutler and Hunt, in which they summarized the evidence that embolism was a causative factor. They pointed out that the clinical picture was often that of embolism, with its sudden onset and characteristic signs, that the occurrence of complications was not unusual after

the use of local anaesthesia, and that embolism was most likely to occur in parts of greatest mobility and in parts which had an easy access by blood and lymphatic channels to the lungs. The conclusion must therefore be stated that some post-operative pulmonary complications, possibly even after inhalational anaesthetics have been employed, are due to a lack of watchfulness or care on the part of the surgeon. He may have carried out a procedure hundreds of times with success, and this, lulling him into a false feeling of security, may lead him to be less gentle with the tissues than usual, or to take risks which he would not take in a procedure comparatively new to him, and perhaps may make him forget that all patients and their resistance are not cast in a single mould.

Since we know that both surgeon and anaesthetist must be held responsible for some post-operative lung complications, a knowledge of how they may be prevented becomes doubly important. Reference has been made to this subject in order that attention may be drawn to the report of a "round table conference" held at the clinical conference of the American College of Surgeons in October, 1938.<sup>1</sup> The report consists of three articles. In the first, Emile Holman, of the Department of Surgery of the Stanford University Medical School, deals with the precautions which, in his opinion, should be taken before operation. He states his conviction that the preoperative preparation of a patient determines the length of the period of convalescence. In the presence of an acute surgical emergency the surgeon has no choice, but has to operate without delay. But even in these circumstances Holman would give available purified vitamin products by hypodermic injection, though he finds them too costly at present for extensive use. Leaving emergency operations on one side, we may safely state that not enough consideration is given to the general preparation of a patient for operation. Most clinicians will agree that to admit a patient to hospital today and to operate on him tomorrow is not always in his best interests. Overcrowding of hospitals, questions of finance and other factors often combine to prevent his having a period of rest in hospital before he

<sup>1</sup> *Surgery, Gynecology and Obstetrics*, April, 1939.



faces the ordeal of operation. Holman quotes Minot:

The major problems of nutrition do not concern clear-cut deficiency diseases, but the prevention of partial deficiency. Borderline states of nutritional instability are much more common than is usually appreciated. There is a wide zone between optimal nutrition and the level at which classic symptoms of recognised dietary deficient states develop.

Holman mentions as an example of a patient in a poor state of nutrition for the ordeal of operation one who is undernourished or malnourished, with a low proteinæmia, or one in whom the vitamin store has been depleted by disease or by a diet lacking in essential vitamins. He refers in some detail to experimental investigations showing the importance of vitamins in the healing of wounds and in the prevention and treatment of infection, and adds that in operations of election patients are put on a high vitamin diet for one or two weeks before operation and are also given vitamins A, B<sub>1</sub>, C and D in concentrated form. Whenever possible he delays operation on a patient admitted to hospital for three days so that this preparation may be carried out. Holman also advises that a patient should if possible be admitted to hospital at least three days before operation, to prevent exposure to infection by a common cold in the twenty-four hours before operation. The other measures on which he lays stress are the avoidance of over-medication with the barbiturates and with morphine derivatives, which act as respiratory depressants, the emptying of bronchiectatic cavities before operation, the use of a moderate Trendelenburg position in certain circumstances, and the intravenous administration of glucose solution two hours before operation to counteract the starvation and deprivation of water to which the patient has been subjected in the twelve hours preceding operation.

The second article in this series is by E. C. Cutler, professor of surgery of Harvard University, who has already been mentioned. He writes on the operative efforts that should be made toward the prevention of post-operative complications. At the very basis of this problem, he states, lies the "primitive psychological reaction" of the surgeon who does not like to carry the blame for unfortunate sequelæ and who naturally seeks an explanation

other than of his own creation. It is so easy to say that the inhalation of an irritating substance has caused the trouble. Cutler will have none of this. He points to the undeniable fact that these complications occur after local infiltration anaesthesia in just about the same percentages as after inhalation anaesthesia. It is also true that the surgeon who is rough, who allows desiccation of the tissues to occur, and who takes little care of hæmostasis, experiences a higher percentage of complications than his more gentle and careful colleague.

The measures that should be adopted after operation in order to prevent complications are the subject of the third paper by C. S. Beck, of the University Hospital and the Western Reserve University. Beck's chief plea is for hyperventilation of the lungs by means of inhalations of carbon dioxide. The use of carbon dioxide is regarded by many as an indispensable adjunct to the ordinary inhalational anaesthetic agents. Beck holds, and rightly, that if inhalational anaesthesia is used, the patient should be awake or responsive to stimuli when the operation is finished. The anaesthetist may bring the patient rapidly to this stage by the judicious use of carbon dioxide. In any case the anaesthetist has no business to leave his patient before he is responsive to stimuli and to all intents and purposes awake. The days should be long since past when a patient is returned to bed unconscious and perhaps somewhat cyanosed, in the care of an inexperienced probationer nurse, who clutches him by the angle of the lower jaw with one hand and waits expectantly for him to vomit into an enamel bowl which she holds in the other. Beck also discusses the position of the patient and its occasional alteration, as well as the desirability of restraint in the use of morphine and other drugs which are likely to interfere with the cough reflex.

The report of this round table conference carries lessons not only for the surgeon but also for the expert anaesthetist, as well as for those whose experience in anaesthesia has not been wide. The last mentioned may be reminded by it of facts which they have perhaps overlooked, and will see the need for perfecting themselves in the anaesthetic

art. The three authors had little to say about the actual administration of anæsthetic agents, probably because those whom they were addressing were either surgeons or trained anæsthetists. No mention has therefore been made in this review of this aspect of the question. The expert anæsthetist who reads this report will realize that he, like the surgeon, must be continually on the watch lest familiarity gives him a false feeling of security and begets in him a carelessness which he would be the first to resent in others.

### THE PERTH CONGRESS.

CONSIDERABLE headway has been made with the arrangements for the sixth session of the Australasian Medical Congress (British Medical Association), to be held at Perth, Western Australia, from September 2 to 7 next year. Ever since it became necessary owing to the financial depression to postpone the congress which was to have been held at Perth in October, 1932, members of the British Medical Association throughout Australia have been hoping that the Western Australian Branch would be able to hold a congress at Perth and to enjoy the stimulus to scientific thought and united action always associated with such undertakings. Since 1932 the "congress habit" has been fostered—successful and happy sessions have been held at both Hobart and Adelaide—and hopes are running high for the gathering at Perth next year.

The President-Elect, Dr. D. D. Paton, is fortunate in having an enthusiastic executive committee to help him. Dr. Noel M. Cuthbert is honorary general secretary, and has as his two assistants Dr. Hector Stewart and Dr. G. B. Gibb Maitland. Dr. J. T. Holland is honorary treasurer. The central theme of the congress is to be rheumatism; and we are happy to be able to announce that Dr. W. S. C. Copeman, of London, Medical Secretary of the Empire Rheumatism Council, has accepted the invitation of the executive committee to attend the congress and to open the discussion on rheumatism at the plenary session on September 3. Dr. Copeman is widely known as an authority on

rheumatic disorders, and has made several notable contributions to the literature of the subject. At the Adelaide congress the discussions on tuberculosis produced far-reaching results, and it is not too much to hope that the discussions on rheumatism at Perth will throw light on this obscure disease as it affects the people of the Commonwealth and will eventually do something towards the mitigation of its ravages. As readers of this journal are well aware, a special group for the study of rheumatism is to be formed within the British Medical Association in Australia; and it is hoped that an Australian branch of the Empire Rheumatism Council will be brought into being by this body. The executive committee has received much encouragement from the Royal Australasian College of Surgeons, which has decided to hold its annual meeting at Perth immediately before the opening of congress. Some of the discussions usually held at the annual meeting of the college will be held in conjunction with those of the section of surgery of congress. In arriving at this decision the council of the college has taken what we may describe as the wide Australian view—it has shown its concern for the furtherance of Australian medicine as a united whole and its desire for the cohesion of all Australian medical practitioners under the banner of the British Medical Association.

In another place in this issue will be found details of some of the arrangements already completed for congress. In noting these details, and those which will be published from time to time, readers are urged to make their plans to include a visit to Perth next year.

### Current Comment.

#### TUBERCULOSIS OF THE TONSILS.

LARGE numbers of investigations have been made into the frequency of tonsillar tuberculosis, and as the result of painstaking histological studies it is well established that this condition is very common in cases of pulmonary tuberculosis. Wonder might be expressed that clinical recognition of this focal variety of tuberculous infection is very seldom made, but the diagnosis is usually possible only after sectioning of the organ. E. R. Long, M. V.



Seibert and L. M. Gonzalez in a recent contribution to the literature on this subject make it clear that the physician need not reproach himself for deficient observation.<sup>1</sup> In the Henry Phipps Institute at Philadelphia they observed that although 500 patients with active pulmonary tuberculosis of the adult type are seen annually, many with advanced disease, careful examination of the throats of these patients gave rise to no suspicion of tonsillar involvement. The real point of interest is, of course, whether primary tuberculosis of the tonsil is common or not. Weller had previously observed that the most frequent type of infection observed was focal and cryptic, and was unilateral in distribution. He believed that this pointed to the possibility of primary infection, and noted it as occurring with particular frequency in nurses, hospital interns and senior medical students. Other writers have considered the tonsils to be very rarely primarily infected, and the general belief seems to be that most cases are due to secondary insemination from sputum. Ghon and his co-workers in particular believe that primary tonsillar infection is very rare, though it must be remembered that the French school of thought, represented by Calmette and others, regard the alimentary tract as an important portal of entry for the tubercle bacillus.

The present authors have concerned themselves chiefly with two problems: the origin of the small tubercles not infrequently found in tonsils removed from persons in whom there exists no evidence of other tuberculous infection, and the method of secondary infection of the tonsils in frank pulmonary disease, whether by the blood stream or direct implantation from sputum. The material for their study was obtained from tonsils removed from Indians of tribes known to have a high rate of tuberculous infection and also from average hospital services in Puerto Rico and Philadelphia, where the tuberculosis incidence rates are high (though lower than that in most Indian reservations) and average respectively. The clinical condition of the relevant patients was determined as far as possible, and where evidence of tonsillar tuberculosis appeared a skiagram of the chest was obtained whenever possible. Certain special patients were subjected to intensive study in order to shed light on the portal of infection, but as may be imagined it was by no means easy to come to definite conclusions. In all, two thousand pairs of tonsils were sectioned and examined microscopically for tuberculosis, a task which compels our admiration. Evidence of tuberculous disease was discovered in 81 pairs of tonsils; the percentage was 6.5 from the Indians on reservation, 2.5 from Puerto Rico and 0.25 from Philadelphia. It is interesting to note that these figures represent fairly well the known incidence of pulmonary tuberculosis in these various communities. X ray studies were made in 35 of these 81 cases and 18 persons showed signs of active pulmonary disease. In this latter group the histological appearances

suggested infection by direct entry rather than by the blood stream. In eight cases there were signs of regressing or healed disease and in nine cases no evidence of other tuberculosis would be found at all. In the latter series it would seem that infection was primary, but in most of these the tonsillar disease was represented only by a few epithelioid tubercles and was usually unilateral. Long and his co-workers point out that tuberculosis of the tonsils tends to be massive and bilateral in cases of frank pulmonary disease and is chronic in type, and they conclude that it is probably due to direct repeated infection. They believe, as others have, that it is likely that the majority of patients with progressive pulmonary tuberculosis have at some time or other involvement of the tonsils as well. We may remind ourselves in this connexion that it is perhaps not quite correct to say that the only risk in pulmonary tuberculosis comes from sputum, using the word in its usual sense. Lastly it would appear that primary tonsillar infection can take place, but whether this carries with it serious results or whether it may sometimes represent a successful immunization after Nature's risky but sometimes effective method, cannot be answered dogmatically.

#### OVER-TREATMENT OF SYPHILIS.

INADEQUATE treatment of syphilis is not uncommon, but over-medication in that disorder introduces problems of a different nature. F. E. Cormia considers that the manifestations of poisoning by drugs in the treatment of syphilis may result from acute poisoning, chronic cumulative effects or idiosyncrasy.<sup>1</sup> The arsphenamines are more apt to bring about acute or idiosyncratic reactions. Gastro-intestinal derangements are common, and the skin, the smaller blood vessels, the bone marrow and the liver are particularly vulnerable. The effects of the heavy metals are more often cumulative, and mercury especially is a gastro-intestinal and kidney irritant. Weakness, debility and anæmia are well-known sequelæ to its employment. Cormia considers that severe reactions to bismuth preparations are uncommon unless due to technical errors in administration. Mild stomatitis is not infrequent. Headache and joint pains and bismuth "grippe" are less common. Eczematoid dermatitis may occur. However, the combined employment of arsphenamine and bismuth produces an increased number of reactions. J. S. Stokes has observed that arsphenamine alone produced 32.7% of reactions, while 56.3% followed the combined use of arsphenamine and bismuth. In many clinics the simultaneous use of bismuth and "Neoarsphenamine" is reserved for young and robust individuals and for those in whom the disease is comparatively recent. Otherwise the drugs are usually exhibited alternately. Cormia states that

<sup>1</sup> Archives of Internal Medicine, April, 1939.

<sup>2</sup> The Canadian Medical Association Journal, May, 1939.

during the past few years he has noted examples of a well-defined syndrome of over-treatment in patients receiving bismuth and "Neoarsphenamine", and he considers that this has not been accorded adequate recognition. The gradual development of this syndrome and its insidious nature have made the symptom complex particularly susceptible to misinterpretation, and Cormia insists that many patients have incurred mental or physical breakdown owing to persistence in ill-timed therapeutic measures. Such a statement calls for serious consideration.

Cormia describes in detail the syndrome as presented by three patients. He further gives the history of a patient who exhibited intolerance to both bismuth and arsenic, but who had not the special features of the syndrome. He includes a fifth case illustrating the influence of arsenical therapy in evoking some of the characteristic features. The patients exhibiting the distinctive symptom complex all complained of a remarkable degree of nervous irritability which could not be specifically referred to inherent or environmental factors. This irritability was displayed as exaggerated responses to external stimuli, general emotional instability with uncontrollable temper, lapses of memory and persistent insomnia. Diffuse throbbing headaches, which often indicate bismuth intolerance, were consistently present. The depressing influence of the bismuth administration was exhibited in fatigue, weakness and loss of weight. The patients were easily tired and had persistent malaise, even while resting from their usual occupation. Cormia considers that this depressing effect is not often observed when bismuth is given alone, and he concludes that it resulted from the prolonged combined administration of arsenic and bismuth. In two instances, however, toxic hepatitis following arsenic exhibition was largely responsible for the general depressing effects. Loss of appetite, chronic dyspepsia and constipation were present in all five patients. In two patients, however, this was partly attributable to the arsenic administered. Cormia admits that nervous system hyperirritability with sympathetic reflex changes could not be eliminated as a factor in the gastro-intestinal stasis. In one patient, who was subjected to barium examination, no evidence of spasticity was found in the gastro-intestinal tract. In three of the patients there was a chronic non-productive cough, with no signs of bronchitis or evidence of aneurysm. It is noted, however, that chronic cough has been stated by C. Leff to be a prominent symptom of bismuth intoxication. As there were no instances of post-arsphenamine dermatitis, Cormia excluded exfoliation of the bronchial tree as the cause of the cough. Such exfoliation has been observed in extensive cutaneous eruptions caused by arsenic. Possibly, however, the combined action of bismuth and arsenic may be the cause of the cough, or it may result from a secondary mild infection resulting from the lowered general resistance.

The important influence of the arsphenamines in producing this syndrome is evidenced by the frequency with which other reactions specifically referable to arsenic developed. Cormia enumerates these and adds that it should not be forgotten that the arsphenamines, when given in short courses and in relatively small doses, have a well-recognized tonic and non-specific stimulating effect. On the other hand, when large doses are given over protracted periods, as was done in all five of the present series, the effect is one of chronic depression. Cormia considers that nervous irritability is an integral part of such depressive or cumulative toxic action.

Three of these five patients had latent inactive syphilis. A fourth patient developed mucocutaneous relapse, but was grossly over-treated with arsenic in relatively huge dosage (0.9 gramme for a woman weighing only 98 pounds). A fifth patient had involvement of the central nervous system of the parietic type and naturally did not respond to standard antisyphilitic treatment. Cormia insists that all of these cases illustrate the current trend of under-examination and over-treatment of the syphilitic patient. He stresses his opinion that in latent syphilis especially the fetish of treatment is carried to undesirable lengths. Whether he is right in this contention is surely a matter of opinion. He holds that until the practising physician before the initiation of treatment makes a complete investigation of every patient who has sustained syphilitic infection, and until he seeks to discover what lies at the back of a positive Wassermann reaction and also endeavours to differentiate late, inactive and latent from active visceral syphilis, tragedies will continue to happen. Cormia has given us much food for contemplation and consideration. Knowledge and caution will eliminate most but probably not all of these untoward happenings, for we cannot control all the vagaries and peculiarities of the human body which is being treated.

#### A MUSEUM OF ANÆSTHETIC APPARATUS.

THE Australian Society of Anæsthetists, at its recent meeting reported in this issue, announced the formation of a museum of anæsthetic apparatus, to be housed in Melbourne. The society feels that an attempt should be made to collect the apparatus of bygone times and to house it as a permanent exhibition before it is scattered or broken beyond recall. It is hoped to combine with this historical display a series of exhibits illustrating the evolution of present-day anæsthetic methods and the structure of anæsthetic apparatus in current use. It is probable that many medical men are possessed of old apparatus and books of museum interest which they would be willing to present to a central museum. Contributions will be very gladly received and acknowledged by the Honorary Secretary, Australian Society of Anæsthetists, 14, Collins Street, Melbourne, C.1.



## Abstracts from Current Medical Literature.

### RADIOLOGY.

#### Fresh Aspects of Appendicitis.

PHILIP SAHYOUN AND ALBERT OPPENHEIMER (*American Journal of Roentgenology*, February, 1939) state that it is still doubtful what signs of an appendicular lesion, recognized by radiological examination and verified histologically, can be considered responsible for the complaints of the patients. Some of the anatomical changes that are visible radiologically may represent merely the dry residues of remote disease or lesions not now in an active stage. A normal appendix fills completely and uniformly within six hours, provided there is normal passage of the barium through the stomach and small intestines. Failure of the appendix to fill at six hours may be due to atony of the caecum. If the appendix is not filled after six hours, a second opaque meal should be given, followed after one hour by two cubic centimetres of castor oil. Castor oil is known to stimulate caecal peristalsis, and very commonly under this stimulation an appendix which did not fill without its administration fills normally. Unlike its filling, the emptying of the appendix is essentially due to appendicular peristalsis. Mass peristalsis does not help the appendix to empty. Similarly, stimulation of the colon by enema, injection of pituitrin and administration of prostigmin do not normally cause any alteration of the appendicular shadow. In all normal persons observed (more than a thousand) the appendix was found empty before the caecum had emptied itself. An appendix is healthy when it fills within six hours after the beginning of gastric evacuation, empties before the caecum does, is uniform in calibre, and dense and homogeneous in contrast. Free mobility and absence of tenderness are not essential points. In appendicitis, whether acute or chronic, stasis in the appendix itself is the leading radiological sign. This stasis is isolated; barium is retained in the appendix after evacuation of the whole colon, or at least of the caecum. Appendicular stasis coexistent with colonic stasis is rare and of no diagnostic significance. Filling of the appendix depends upon an extrinsic mechanism; the peristaltic pressure exerted by the caecum forces barium into the appendix when its mouth is open. Emptying of the appendix, on the contrary, is intrinsic in nature, being due to appendicular peristalsis. Normally there is a balance or complementary correlation of caecal and appendicular peristalsis. Whenever stasis was found radiologically, certain histo-pathological signs of chronic inflammation were demonstrable. This holds true even in the presence of kinks, hitherto supposed to interfere

in a purely mechanical way with the evacuation of the appendix. When stasis occurs in such cases it always coexists with histological signs of inflammation.

#### Intrathoracic Aneurysms.

PETER KERLEY (*The British Journal of Radiology*, March, 1939), in discussing the diagnosis of aortic aneurysms, states that all aneurysms involving the transverse and descending parts of the arch displace the oesophagus to one side or the other. This is a most helpful sign; in the difficult cases it is more helpful perhaps than any other, because there are few non-vascular tumours of the mediastinum that produce much displacement of the oesophagus. Pressure on the nerves is common, but only phrenic pressure can be demonstrated radiologically. Pressure on the trachea or large bronchi is responsible for the bronchitis and dyspnoea. Streaks of blood in the sputum are usually secondary to the bronchitis, but may be a result of pulmonary congestion if a large vein is squeezed by the aneurysm. In particular the vein in the upper lobe of the left lung is easily compressed by an aneurysm of the descending part of the aortic arch. A frank haemoptysis may also be due to congestion and should not be rashly interpreted as leakage of the aneurysm into a bronchus. The night sweating can be explained by pressure on the sympathetic nerves, and the dyspeptic symptoms by pressure on the vagus nerve. Only one patient had slight dysphagia, although in every case involving the middle and descending parts of the aortic arch the oesophagus was displaced by the aneurysm.

#### Cardiac Aneurysm.

JOHN PARKINSON, D. EVAN BEDFORD AND W. A. R. THOMSON (*The British Journal of Radiology*, March, 1939) state that in the past aneurysms have been described as involving the apex, base or anterior wall of the heart; but now they should be grouped with their parent infarct as anterior or posterior, according to the coronary branch occluded; and corresponding also to the two main electrocardiographic patterns. Anterior aneurysms usually involve the apex to some extent, but posterior aneurysms need not do so. In the case of anterior aneurysm the heart is usually, though not always, enlarged to the left, and its contour is deformed. The aneurysm often involves the lower half of the left ventricular contour, in which case the apex appears broadened or blunted, giving the heart a square or rectangular appearance. There may be an angular deformity of the left border of the heart, and the angle may project to the left beyond the apex proper. The aneurysm may project from the upper half of the left ventricular contour either as a diffuse bulge or more rarely as a localized hump. The right oblique position is especially favourable for visualization

of an aneurysm projecting forwards from the anterior ventricular wall. Typically the aneurysm projects forward so that its upper margin forms a more or less abrupt ledge or shelf on the anterior contour of the heart, and the author has come to regard this "ledging" in the right oblique position as one of the most important signs of cardiac aneurysm. Aneurysm of the posterior wall of the left ventricle is rare. The anterior skiagram reveals a diffuse bulge at the upper part of the left ventricular border, separated by a notch from the left ventricle proper. In comparison with an anterior wall aneurysm it is situated at a higher level; otherwise its appearance is similar. In this case the left oblique skiagram is diagnostic, for it shows the aneurysm projecting backwards from the upper part of the posterior wall of the left ventricle and indenting the barium-filled oesophagus. Infarcts of the inter-ventricular septum occasionally yield and form an aneurysm which bulges into the right ventricle, causing extreme enlargement of the heart to the right.

#### Lipoid Pneumonia in Infants and Children.

R. S. BROMER AND I. J. WOLMAN (*Radiology*, January, 1939) point out that pneumonia due to the aspiration of oily substances is not uncommon and can be considered a clinical and pathological entity. Infants with physical debility and neurological disorders seem to be unusually susceptible. The radiological diagnosis is based upon location of lesions in the perihilar regions, in the posterior portions of the lungs, and to a greater degree in the right lung than in the left. In the moderate and mild cases serial Röntgenograms and an accurate history are needed before a positive diagnosis can be attempted. The necessity for serial examinations cannot be too strongly emphasized. It is not wise to employ liquid petrolatum *et cetera* as nose drops for any small, weak or debilitated child. When infants are inclined to vomit oil it is important that they be placed on the side or abdomen rather than upon the back. Cod liver oil or liquid petrolatum should never be forced.

### PHYSICAL THERAPY.

#### Radiotherapy in Hodgkin's Disease.

RENÉ GILBERT (*American Journal of Roentgenology and Radium Therapy*, February, 1939) discusses the anatomical and clinical features of Hodgkin's disease and the governing principles of treatment, with results. In the absence of any treatment based on aetiology, systematic X ray therapy constitutes the therapeutic method of choice; on account of the essentially lymphoid character of its lesions, malignant granulomatosis usually has an exceptional degree of radio-sensitivity. The diagnosis should be

made as early as possible and should rest on a biopsy whenever this is practicable. The action of X rays on the granulomatous tissues is a direct cytolytic one and is followed by the production of fibrous connective tissue. The aim of treatment is to obtain as long remissions as possible, thus restoring the patient to apparently normal health and complete capacity to work. This involves the methodical treatment of all foci, deep and superficial, in succession, with first attention to those regions requiring the earliest treatment. The average length of the survival period is incontestably prolonged by irradiation; various authors say it has been doubled and even tripled. The patient's general condition during remissions is improved; in the slow forms of the disease apparent clinical cure with full capacity to work may be obtained. In his own series of patients treated up to 1937, Gilbert states that 45.7% lived for more than three years after treatment and 34.2% lived for more than five years.

#### Histological Tumour Variants and Radiosensitivity.

I. A. B. CATHIE (*Radiology*, April, 1939) points out that while within limits the different classes of tumour tend to maintain their specific lethal dosage, yet exceptions are frequent. What is considered to be a resistant growth may disappear under palliative treatment, while a usually sensitive tumour may prove entirely resistant. These variations from the normal are a constant worry to the radiotherapist. Cathie has attempted to correlate the histology of a large series of tumours, with their clinical response to irradiation. The biopsy material for the investigation was obtained from some 5,500 patients, selected for radiation therapy over a period of five years. The radiotherapeutically atypical tumour was sought from two directions. In the first place, when any patient showed an abnormal response to treatment, sections from his tumour were examined in the light of this response. Secondly, when any tumour showed a deviation from the typical histological picture, the patient was observed closely to see whether this deviation could be correlated with an abnormal response to therapy. The bulk of the material consisted of growths of squamous or basal cell origin from skin, mouth, pharynx or cervix. The rest constituted a fairly representative series of growths; but the numbers of tumours of the thorax, abdomen and brain was practically non-existent. In the squamous cell carcinoma group the majority were of medium sensitivity; but some variant groups were recognizable histologically. Spindle cell epithelioma nearly always proved to be a resistant tumour. About one-half of the epitheliomata of the tongue in association with syphilis proved radio-resistant. No significant difference was noted between the responses of

keratinising and anaplastic tumours, contrary to the usually accepted dictum. The diagnosis of lympho-epithelioma was made six times, and each of the tumours proved highly radiosensitive. Cathie is inclined to think that many, if not most, of the histologically diagnosed lympho-epitheliomata are in reality lympho-sarcoma. Another group was transitional cell carcinoma, and all in this group were characterized by pronounced radiosensitivity and early metastases. In the basal cell carcinoma group it was found that when the section showed any squamous differentiation, such as keratinization or prickle cell formation, the tumour was more resistant than would have been expected. The post-radiation recurrent basal cell carcinoma often shows spindle cell formation, and then surgery, not irradiation, is the method of treatment. Atypical basal cell carcinomata, such as tricho-epithelioma and *epithelioma adenoides cysticum*, proved radio-resistant. In carcinomata of the cervix uteri those of the transitional cell group were found to be more radiosensitive than the squamous carcinomata, and the four-year survival rate was 11% more in the former than in the latter group. Adeno-carcinoma of the cervix was found in 15 cases, and the four-year survival rate was over 50%; this supported the view that this type of growth was not so resistant as was formerly supposed. Two patients with rectal carcinoma died after treatment and no viable growth was found in the rectum at autopsy. The growth in each case was of the anaplastic round cell type. Columnar cell carcinoma of the body of the uterus was found to be not very resistant. Sarcomata of the lymphocyte series were found to diminish strikingly under irradiation; but the differentiated fibrosarcomata, chondrosarcomata and osteogenic sarcomata proved uniformly radio-resistant. Recurrent Paget's fibroma of the rectus sheath was radiosensitive.

#### Tumours of the Lung, Mediastinum and Pleura.

M. C. TOP (*Edinburgh Medical Journal*, Volume XLVI, 1939) describes in detail the pathology of malignant tumours of the lung, mediastinum and pleura, and then discusses at length the methods of treatment available. It is emphasized that the relationship of pathology to treatment is most important, and in many of these cases external irradiation is the only possible method of treatment. It is pointed out that surgery and the implantation of radon seeds through the bronchoscope claim a few successes; but these are only applicable at a stage of tumour growth so early that the diagnosis of neoplasm is rarely made. As a rule external irradiation with deep X rays is the only therapy which can be considered. Cases described in the literature are analysed; and in the author's own

series there are 104 cases of bronchial carcinoma, 12 mediastinal tumours, 4 pleural tumours, 92 cases of Hodgkin's lymphadenoma, 48 cases of lymphosarcoma, 2 cases of myelogenous leucæmia with secondary deposits in the lung, and every possible variety of secondary cancer. The important malignant neoplasms within the thorax are bronchial carcinoma, primary neoplasms of the lymph nodes and metastatic tumours. As soon as the diagnosis of intrathoracic neoplasm has been made X ray therapy should be begun. If at all possible a lethal dose should be delivered to the tumour; but before this is attempted obvious metastases should be excluded by careful clinical and radiological examination. For bronchial cancer the tumour dose should be not less than 6,000 r in six weeks; for primary neoplasms of lymph nodes it should be from 2,500 to 4,000 r in five to six weeks, according to the size of field used; for rare tumours it is probably wise to aim at a tumour dose of 6,000 r. Cure is possible only in very favourable cases; but palliation is important, and even if metastases are known to be present in bronchial cancer, or multiple involvement in primary neoplasm of lymph nodes, palliation should be attempted. If the treatment is palliative, it is essential to avoid reactions which will increase the patient's discomfort.

#### The Treatment of Acute Pneumonia with Röntgen Rays.

E. V. POWELL (*American Journal of Roentgenology and Radium Therapy*, March, 1939) has been using X ray therapy in the treatment of acute pneumonia since 1933. It was used first of all in alternate cases; but he now uses it as a routine measure, since it has been found a very valuable therapeutic agent in this disease. Pneumococcal antiserum was used in only three cases. Patients of all ages have been treated, and the mortality rate was less than 5% in lobar pneumonia and 13% in bronchopneumonia. These figures compare very favourably with records of mortality rates before the use of X ray therapy—29% in lobar pneumonia and 30% in bronchopneumonia. Most of the patients showed relief of distress and general symptomatic improvement within a few hours, and more than one-third of them have shown a fall of temperature to normal or below within thirty-six hours after treatment. Up to February, 1939, 231 patients have been treated, of whom 16 have died—a mortality rate of 7%. A medium voltage is used and 250 to 350 r are given either anteriorly or posteriorly over an area a little larger than the involved portion of the lung. If the temperature has not returned to normal within thirty-six hours a second treatment of 200 r is given over the opposite skin area. A few patients with mixed infection required a third or fourth treatment. The usual symptomatic medical treatment is used as indicated.



## Medical Societies.

### AUSTRALIAN SOCIETY OF ANÆSTHETISTS.

THE third general meeting of the Australian Society of Anæsthetists was held at the Royal Australasian College of Surgeons, Spring Street, Melbourne, on April 3 and 4, 1939, Dr. GILBERT BROWN in the chair.

#### Secretary's Report.

The secretary's report covering the period which had elapsed since the second general meeting held at Adelaide in 1937 was read and adopted.

#### Balance Sheet.

The balance sheet, which is published herewith, was presented and adopted.

#### A Library and Museum.

It was decided to establish an anæsthesia library and a museum of anæsthetic apparatus, to be situated in Melbourne. A notice in connexion with the museum of anæsthetic apparatus will be found in the editorial columns of this issue.

#### Election of Office-Bearers.

The following office-bearers were elected for the year 1939-1940:

*President:* Dr. G. Troup (Western Australia).

*Vice-President:* Dr. Hugh Hunter (New South Wales).

*Secretary:* Dr. G. Kaye (Victoria).

The election of State representatives was referred back to the members in the several States, so that they might have the opportunity of deciding whether the existing State representatives should be elected or not.

Dr. I. C. James (Victoria) was elected librarian and was co-opted to the Executive Committee.

#### The Medical School and the Study of Anæsthesia.

PROFESSOR P. MACCALLUM, as guest speaker, read a paper on "The Medical School and the Study of Anæsthesia". He began with the proposition that the intelligent practice of the administration of anæsthetics involved a study of the subject of the action of anæsthetics and the acquisition of certain techniques of administration.

An engineer might be an indifferent driver and no amount of driving skill would make a chauffeur an engineer. The amateur engineer who was also an amateur driver was singularly helpless when things went wrong with his motor car.

The competent anæsthetist was in practice engineer and driver. Scientifically speaking he was essentially an experimental pharmacologist (cooperating with the surgeon) with the patient as his guinea-pig. His pharma-

cology was necessarily of a conservative kind and the range of investigation limited. In the light of his own experience and that of others he steered the course of his experiment as clear as might be from known risks to the life of his patient. Practice was rightly confined to the application of principles already established, and the voyage was not primarily one of discovery.

That exploration had not been lacking was clear from recent developments in the use of hypnotics, in the synthesis and testing of new compounds for anæsthetic properties, in the devising of new instruments of precision for the delivery of anæsthetics to the patient, and for the analysis and record of his responses and in the technique of preparation of the patient.

The medical school was concerned with teaching of students and the advancement of knowledge of the subject. With a general background of physiology it imparted instruction in the principles of anæsthetics and the rudiments of their administration, and in the necessity for cooperation with the surgeon in team work for the patient's benefit. But it was obvious that the undergraduate instruction possible could not pretend to produce specialists or even guarantee competence. It did what it could to see that he knew what he was doing in administering an anæsthetic.

The acquisition of the skill of a competent anæsthetist was essentially a post-graduate activity. Its essence was learning by doing, and in this the university medical school played a negligible part. The university had no function in the assessment of such skill. It must, however, see to it that its students were equipped to enter on the course of training to acquire it.

The advancement of knowledge of anæsthesia was a very proper concern of the school of medicine, and here it had to look to its graduates to bring their many problems to the bar of investigation. There were funds available to foster such research, too little called upon. While the difficulties of the practising anæsthetist wishing to make investigations were great, some of these problems were of the kind that could be tackled only by systematic record and observation of patients by a skilled anæsthetist. Some of them required laboratory cooperation. Some of them, at least in the initial stages, could be undertaken only under laboratory conditions, and most appropriately in a department of pharmacology. Some might demand the cooperation of the chemist. They strongly indicated that there was scope for fruitful cooperation between the practising anæsthetist and an academic department, and that the anæsthetist had contributions to make to medical knowledge.

Dr. GILBERT BROWN (South Australia) thanked Professor MacCallum for his address, to which he had listened with great pleasure. As an instructor in anæsthesia, Dr. Brown felt very conscious of a need for guidance in the best form of instruction for students and house officers. Unluckily, not every graduate secured a house appointment, as was illustrated by the case of a man known to Dr. Brown, who graduated, was married and performed his first cholecystectomy all on the same day. Dr. Brown said that he told his students that anæsthesia could be

#### Balance Sheet, 1937-1939.

	£ s. d.		£ s. d.
To Subscriptions, 1937 Dinner .. .. .	6 0 0	By Expenses, 1937 Dinner .. .. .	7 9 3
" Ordinary Subscriptions .. .. .	14 0 0	" Petty Expenses .. .. .	5 10 0
" Credit Balance, August 21, 1937 .. .. .	43 5 6	" Bank Charges .. .. .	0 15 0
" Cash in Hand, August 21, 1937 .. .. .	2 4 10	" Cash in Hand, March 30, 1939 .. .. .	1 14 10
		" Credit Balance, March 30, 1939 .. .. .	50 1 3
	<u>£65 10 4</u>		<u>£65 10 4</u>

Audited and found correct.

(Signed) GEOFFREY KAYE, Secretary-Treasurer.

GILBERT BROWN, President.

Melbourne,  
April 3, 1939.

learned only by practice. When he first joined the staff of the Adelaide Hospital, eighteen years earlier, there had been a Clover's inhaler and a chloroform mask and five lectures for students. Today there were all forms of modern anæsthetic technique—and still five lectures. Anæsthetists in Australia had not in many instances even a whole-time occupation in anæsthesia, still less in anæsthetic teaching; the quality of the teaching must therefore suffer in comparison with that in overseas departments with a whole-time staff. Further, under Australian conditions serious research was impossible. It was also disappointing to see the small extent to which training in anæsthesia given to students was turned by them to account after they had attained to house office.

Dr. G. KAYE (Victoria) said that, as one of Professor MacCallum's men at the University of Melbourne, he felt impelled to pay tribute to the support given by Professor MacCallum to the university teaching of anæsthesia. So far as was possible under the existing curriculum, the university (in the person of Professor MacCallum) had given every encouragement to the delivery of a centralized course of anæsthetic lectures that would give to students a background of applied physiology which they could later apply to the clinical anæsthetic teaching they would receive in hospital. Whilst the advantages to be derived from a regular department of anæsthesia were clearly realized in the University of Melbourne, the problem was at present one of practical politics, and consisted mainly in giving to students the best training in anæsthesia which could be managed under the ruling form of curriculum in Australian universities.

Dr. G. TROUP (Western Australia) thanked Professor MacCallum for his address and added his congratulations to those of previous speakers.

Professor MacCallum, in reply, said that there was in Melbourne an "anæsthetic tradition" which dated from the time of Embrey, but which was less well maintained by the anæsthetists of the city than might be. Apart from some research in anæsthesia which was being done at the Walter and Eliza Hall Institute, and which arose out of work being done there on surgical shock, the general attitude to anæsthetic research in Melbourne was somewhat disappointing. The university held funds out of which it was willing to subsidize approved research upon problems of anæsthesia; encouragement was not lacking, and it was to be hoped that anæsthetists would respond to it.

#### Anæsthesia for Specialist Nose and Throat Services.

Dr. R. ORTON (Victoria) read a paper entitled "Anæsthesia for Specialist Nose and Throat Services" (see page 168).

Dr. G. L. LILLIES (Victoria) said that chloroform still had value for cases of acute respiratory infection, such as maxillary mastoiditis and *paracoccus auris*. Anæsthesia had to be little more than a state of sleep once the initial skin incision had been made. He approved of Dr. Orton's liking for light premedication, and suggested that he should try chlorotone (in fifteen-grain doses) instead of barbiturates. It provided very satisfactory sedation and did not depress the blood pressure or the cough reflex.

Dr. G. KAYE (Victoria), without desiring to emulate him, praised Dr. Orton's bravery in administering ether to bronchiectatic patients. As a worker in a bronchoscopic and laryngological "team", Dr. Kaye was in frequent and disconcerting contact with such patients, but did not know what anæsthetic was best for them. Chloroform was too dangerous; nitrous oxide and ethylene failed to control the cough reflex, nor was it easy to administer them to grossly bronchiectatic patients without the occurrence of anoxæmia. Bronchoscopy offered a particularly difficult problem, especially in children or nervous adults, for whom local anæsthesia was inadmissible. The gaseous anæsthetics could not be effectually administered through a bronchoscope; chloroform, "Avertin" or intravenously administered barbiturates were therefore the

only drugs applicable. On the whole, in patients whose pulmonary state rendered them liable to serious anoxæmia under any form of general anæsthesia, chloroform (with all its disadvantages) seemed to be the most controllable of the three. Dr. Kaye drew attention to a high incidence of respiratory sequelæ in operations for acute mastoiditis; in his practice as a whole the incidence of such sequelæ was six per thousand administrations, but in 130 maxillary mastoid operations there was post-operative bronchitis or pneumonia in 4% of the patients. Since patients with acute mastoiditis suffered from generalized infection of the upper respiratory tract, Dr. Kaye preferred to use a gaseous anæsthetic for them, and to refrain from laryngeal intubation when possible. In chronic mastoiditis, however, the patient seemed to have acquired immunity to his own organisms and would tolerate endotracheal ether anæsthesia without ill effects. Dr. Kaye also urged careful cleaning out of the hypopharynx after rhinological operations, illustrating the point by reference to a case of laryngofissure. Here, through neglect to perform such a toilet before withdrawal of the endotracheal tube, a clot in the hypopharynx was allowed to escape into the trachea, with death of the patient from septic pneumonia within thirty-six hours.

Dr. G. BROWN (South Australia) admitted to a dislike of chloroform. For bronchoscopy he cocaineized the pharynx thoroughly and then administered "Avertin". The surgeon in such case should commence the bronchoscopy punctually thirty minutes later. A small amount of chloroform supplement might be necessary, given by passing oxygen over (not through) chloroform in a Junker's apparatus. It was necessary for the surgeon not to lose time in the theatre in adjusting lamps or otherwise, lest the optimal time for the "Avertin" effect be lost. Dr. Brown said that he did not like the intravenous administration of barbiturates to such patients. He asked whether Dr. Orton habitually cocaineized the larynx prior to intubation. He pointed out that rhino-laryngological operations usually returned but a small fee to the anæsthetist, and it was hard for the latter to be asked to give gas in such cases, especially when no positive indication for gas existed. He agreed with Dr. Kaye in hesitating to employ endotracheal methods in the presence of acute upper respiratory infection; he favoured ethylene or cyclopropane in preference to nitrous oxide for such patients. For operations upon the larynx he favoured preliminary tracheotomy, which might be done at leisure under local anæsthesia. On the day of the main operation anæsthesia could be readily induced and maintained through the tracheotomy opening. Such a plan would obviate risk of anoxæmia in the pretracheotomy induction stage, as might occur were the tracheotomy to form part of the main procedure under general anæsthesia. He quoted an illustrative case in which respiratory obstruction, due to the laryngeal lesion, caused so much anoxæmia during induction that hemiplegia supervened.

Dr. H. C. DISHER (Victoria) agreed with Dr. Lillies in a liking for chlorotone as a premedicant, but pointed out that some patients had an idiosyncrasy towards it and might derive a profound narcotic effect from it.

Dr. G. Brown said that when he was a house surgeon, and chlorotone was new, a patient suffering from *paramyoclonus multiplex* slept for thirty-six hours after a dose of fifteen grains of the drug.

Dr. G. TROUP (Western Australia) said that he preferred a general anæsthetic, when possible, for bronchoscopy. His practice was to give one-sixth of a grain of morphine, one one-hundred-and-fiftieth of a grain of atropine, and a sub-basal dose of "Avertin". The air passages were then cocaineized; the administration of a very small amount of ether by the "open" method completed abolition of the cough reflex and no more ether need then be given. For general rhino-laryngological work he advocated use of the Leech "gas-way". This should be well lubricated (preferably with "Percainol" ointment) and inserted very gently, or sore throat might result. With the "gas-way", anæsthesia might be run at a much lighter plane than with an endotracheal tube. He had found cyclopropane to give



rather too much bleeding for nose and throat operations; surgeons were apt to object to it for this reason, especially in tonsillectomy.

Dr. Orton, in reply, said that he was initially sceptical of chlorotone, but was taught to like it by his medical (as opposed to his anæsthetic) patients, who appreciated it as a general hypnotic. He had occasionally encountered idiosyncrasy to it. He disagreed with Dr. Lillies in regard to the choice of chloroform for mastoidectomy and similar operations. He had had little experience of "Avertin" for bronchoscopy, since he worked with surgeons well adept in local anæsthesia and who valued the cooperation of the conscious patient during bronchoscopy. Cocaine in his department had been abandoned in favour of "Pantocaine", but his surgeons were well aware that "Pantocaine" was itself possessed of toxicity. Disliking unnecessary use of cocaine, Dr. Orton did not cocaine the throat before laryngeal intubation. Discussing Dr. Brown's reference to preliminary tracheotomy, Dr. Orton described a case in which it was unsuccessfully attempted; the trachea could not be found because of scarring due to earlier radium therapy. Laryngeal operations under gas anæsthesia meant much awkward transference from mask to endotracheal catheter and alteration in position of the latter; but this difficulty could not well be avoided. Dr. Orton promised to make trial of the Leech "gas-way", and agreed with Dr. Brown that economic factors often dictated the use of ether in nose and throat operations when other methods might have been preferable.

#### Anæsthesia in Intestinal Obstruction.

Dr. GILBERT BROWN (South Australia) read a paper entitled "Anæsthesia in Intestinal Obstruction" (see page 170).

#### Experiences with Cyclopropane.

Dr. G. TROUP (Western Australia) read a paper entitled "Experiences with Cyclopropane" (see page 164).

Dr. G. L. LILLIES (Victoria) congratulated Dr. Troup on his paper and upon his results. Most "anæsthetic deaths", said Dr. Lillies, were not really related to the anæsthesia, but to the surgical lesion. He had himself seen a patient, undergoing thyroidectomy under nitrous oxide anæsthesia, die suddenly in a manner identical with the patient whose case Dr. Troup described. Although apparently in quite good condition, Dr. Lillies's patient died suddenly on elevation of the lower pole of the gland. He had also seen death occur from "pseudo-shock" in a patient anæsthetized with ether-oxygen; death occurred very suddenly on cessation of anæsthesia.

Dr. E. GANDEVIA (Victoria) congratulated Dr. Troup on his paper. He himself had had but little experience with cyclopropane, mainly in cases of toxic goitre, and he thought it an admirable anæsthetic for such cases, because so much oxygen could be given with it that anoxæmia was unlikely to occur. Bleeding, especially from the skin, was increased in the presence of cyclopropane. Dr. Gandevia asked Dr. Troup what were the most reliable signs of cyclopropane anæsthesia. He considered post-operative tracheitis to be not uncommon in thyroid surgery, irrespective of the anæsthetics previously used, but he imagined that cyclopropane might lessen its incidence.

Dr. G. BROWN (South Australia) also congratulated Dr. Troup on his paper. As one inexperienced with cyclopropane (having administered it only forty-nine times) he had come to learn, and his hopes of learning had been justified.

Dr. Troup, in reply, said that he still believed the death described by him during thyroidectomy to be due to overdosage, although Dr. Lillies's patient might have succumbed to reflex shock. He admitted the difficulty of distinguishing the signs of cyclopropane anæsthesia. Fixation of the eyeball was usually to be seen in the early third stage of anæsthesia; a hiatus, in which the signs were variable, then occurred, and the depth of anæsthesia could be estimated only by the general clinical condition

of the patient and the extent to which surgical relaxation had been achieved. The next well-defined stage was that in which irregularity of the pulse began to appear. Dr. Troup said that post-operative tracheitis in thyroid surgery was usually attributable to surgical manipulation of the trachea and not to the anæsthetic; but endotracheal anæsthesia should be avoided if possible, as being likely to increase the incidence of tracheitis.

## Naval, Military and Air Force.

### APPOINTMENTS.

THE undermentioned appointments, changes *et cetera* have been promulgated in the *Commonwealth of Australia Gazette*, Numbers 40 and 41, of June 22 and 29, 1939.

#### PERMANENT NAVAL FORCES OF THE COMMONWEALTH (SEA-GOING FORCES).

*Antedating Seniority.*—The seniority of Surgeon Lieutenant Clive Laurence Statham and Surgeon Lieutenant (D) Oswald Trethewey Amos is antedated to 23rd July, 1938, and 25th July, 1936, respectively.

#### CITIZEN NAVAL FORCES OF THE COMMONWEALTH.

##### Royal Australian Naval Reserve.

*Termination of Appointment.*—The appointment of Surgeon Lieutenant Kenneth Charles Armstrong is terminated, dated 1st June, 1939.

#### AUSTRALIAN MILITARY FORCES AND SENIOR CADETS.

*Honorary Physician and Honorary Surgeon to the Governor-General.*—Colonel S. R. Burston, C.B.E., D.S.O., V.D., Australian Army Medical Corps, is appointed Honorary Physician to the Governor-General, 1st July, 1939, *vice* Colonel D. M. McWhae, C.M.G., C.B.E., V.D., who relinquishes the appointment on 30th June, 1939; Colonel C. G. Shaw, D.S.O., V.D., Australian Army Medical Corps, is appointed Honorary Surgeon to the Governor-General, 1st July, 1939, *vice* Colonel F. A. Maguire, C.M.G., D.S.O., V.D., who relinquishes the appointment on 30th June, 1939.

*Australian Army Medical Corps (Permanent).*—To be Captain (provisionally)—Captain (provisionally) W. V. Russell, Australian Army Medical Corps (Citizen Forces), with pay at the rate of £750 per annum, rising by annual increments of £50 to £900 per annum (subject to variation in accordance with variations in the cost of living in the manner prescribed by regulation 27 of the Military Financial Regulations), inclusive of all allowances except travelling and district allowances, to date 9th May, 1939; appointment to be for a period of two years, subject to reappointment.

#### First Military District.

##### Australian Army Medical Corps.

To be Captain (provisionally) supernumerary to establishment pending absorption—James Allan Hill, 23rd May, 1939; Captain N. H. Morgan is seconded for a period of two years from 23rd April, 1939.

##### Australian Army Medical Corps Reserve.

To be Honorary Lieutenant—Gordon David Johnston, 17th April, 1939.

#### Second Military District.

##### Australian Army Medical Corps.

To be Captains (provisionally) supernumerary to establishment pending absorption—John Leicester Holme, 22nd April, 1939; Adrian Mackey Johnson, 23rd April, 1939; Clarence Arthur Campbell Leggett, 24th April, 1939; James Alan Froude Flashman, 25th April, 1939; Walter McPherson Roberts, 26th April, 1939; William Willis Gunther, 25th

April, 1939; Barry Jarvis, 29th April, 1939; Marcel Sofer Schreiber, 1st May, 1939; George Read, 3rd May, 1939; Edmund James Cairns Molesworth, 4th May, 1939; Neville Murray Stewart, 5th May, 1939; and Harold George Cummine, 6th May, 1939. *To be Captains (provisionally)*—Lance Joseph Cairns and Clyde Tyrer Pethebridge, 27th April, 1939, and 2nd May, 1939, respectively.

*Australian Army Medical Corps Reserve.*

*To be Honorary Lieutenants*—Cyril Stewart Denston, 5th May, 1939, Clarence Albert French, 17th May, 1939, and Mervyn Hetherington Thomas, 22nd May, 1939.

Major L. W. Bond and Captain N. H. Bridge are placed upon the Retired List with permission to retain their ranks and wear the prescribed uniform. Honorary Captain M. J. Plomley is retired.

*Third Military District.*

*Australian Army Medical Corps.*

*To be Captains (provisionally) supernumerary to establishment pending absorption*—John Gavin Johnson, 18th May, 1939; Sidney Gordon Preston, 19th May, 1939; and Ian Thomas Cameron, 26th May, 1939. Lieutenant-Colonel I. Blaubaum is transferred to the Reserve of Officers (A.A.M.C.), 18th May, 1939.

*Australian Army Medical Corps Reserve.*

*To be Captains*—Robert Byram Loosli, 10th May, 1939; Robert Kenneth Birnie and Albert Weigall, 15th May, 1939. *To be Honorary Captains*—Hendry James Perry Ham and Leonard Hartnett, 1st May, 1939; Maurice Charles Davies, 16th May, 1939; William Helliar Long and William Bremner Reid, 17th May, 1939; Nathan Dennerstein, Charles Henry Prouse, Mervyn Henry Bowser Robinson, Clive Mansley Greer, Gordon Forsyth, Cedric Watson Gray Roche and John Griffiths Moreland, 19th May, 1939; Llewellyn Meredith Smith, Reginald Frank May, Aneice Samuel Saleeba, Arthur Ewins Dickmann, Howard Francia Praagst and Fitzwalter Maurice Read, 24th May, 1939; Warwick McLean Smithers, 26th May, 1939; Herbert Harold Spencer, Edgar Alexander North, Ivan Albert Malet LeSouef, Thomas Gillis Wynne and James Cumming Stewart, 29th May, 1939. *To be Honorary Lieutenants*—James Kinross Herd, 1st May, 1939; Pulteney Burn Malcolm, Ernest Clive Bailey and Fritjof Nilsson, 15th May, 1939.

*Fourth Military District.*

*Australian Army Medical Corps.*

*To be Captain (provisionally)*—Reginald Nevill Cudmore Bickford, 17th May, 1939. *To be Captain (provisionally) supernumerary to establishment pending absorption*—Charles Spencer Swan, 19th May, 1939; Captain A. W. S. J. Welch is transferred to the Reserve of Officers (A.A.M.C.), 4th May, 1939.

*Australian Army Medical Corps Reserve.*

*To be Honorary Captain*—Robert Frank West, 17th May, 1939.

*Fifth Military District.*

*Australian Army Medical Corps.*

Lieutenant-Colonel J. R. Donaldson is transferred from the Unattached List, 1st January, 1939; Honorary Captain J. B. Matheson is appointed from the Reserve of Officers (A.A.M.C.) and to be Captain (provisionally), 15th May, 1939.

*Australian Army Medical Corps Reserve.*

*To be Honorary Captain*—John Kirkpatrick Bowler, 17th May, 1939.

*Sixth Military District.*

*Australian Army Medical Corps.*

*To be Major*—Captain F. W. Fay, M.C., 19th April, 1939.

*Australian Army Medical Corps Reserve.*

*To be Honorary Captains*—Tulloch Graham Heuze Hogg, Reginald Ernest Ashbarry and Colin Woolner Clarke, 17th May, 1939.

## Obituary.

### CHARLES HORACE MAYO.

For the following appreciation of the late Dr. Charles Horace Mayo we are indebted to one who knew him but who wishes to remain anonymous.

By the death of Charles Horace Mayo, Rochester, Minnesota, has lost one of her favourite sons, and America one of her greatest surgeons.

It has not often happened in the history of medicine that the reputation of a surgeon has become world-wide during his lifetime. We generally reserve our commendation of a man till after his death; but not so with Charles Horace Mayo. For the last twenty-five years his name and that of his equally illustrious brother William have been the lanterns which have caused Rochester, Minnesota, to be referred to as "the surgeon's Mecca".

His father, William Warren Mayo, was born near Manchester, England, in 1819, and graduated M.D. at the University of Missouri in 1854. In 1863 he commenced practice in Rochester and performed his first laparotomy for ovarian tumour in 1871. Charles Mayo was born at Rochester on July 19, 1865, and graduated M.D. from the Chicago Medical College, Northwestern University, in 1888; so that for a period of over fifty years he has seen the changing practice of medicine, and in many ways has played a most important part in bringing about that change. In all, he has contributed over four hundred articles to medical literature. There are few fields of surgery to which he did not make worth-while contributions; but his name will be associated more particularly with surgery of the thyroid gland, the surgical treatment of *tic douloureux*, of bunion, of pharyngeal diverticula, and of umbilical hernia. Transplantation of ureters into the sigmoid and vaginal hysterectomy were also two of his more important contributions. However, his contributions to medicine were not confined to the clinical side of his profession, for he was one of the first to realize the importance of medicine in relation to public health, an interest which he developed early in his professional career and which always remained one of his most cherished pursuits.

Like Bland Sutton, of Middlesex, whom he somewhat resembled in physical appearance, he was also interested in the lessons to be learned from the study of comparative anatomy and pathology, and in his writings he frequently referred to these facts.

His surgical work was characterized by the simplicity of his methods; no complicated range of instruments adorned his surgical tray. It was often surprising to see him do most complicated operative procedures with the minimum of mechanical aids, his manual dexterity completely hiding their absence.

As a man he was devoid of all artifice and sham. It was his simple naturalness which completely disarmed an opponent or won the affection and admiration of a patient or of an assistant. An accepted invitation to his home became an abiding memory, for, though lovable in all his moods, it was in his home that the true majesty of his character became visible. The simple, implicit, mutual trust of his wife and himself was at once obvious, as were the devotion and pride in their family.

Many Australians have enjoyed the hospitality of his home, and they, together with their less fortunate colleagues, acclaim the memory of an outstanding member of their profession. The sympathy of the medical profession of Australia will surely be extended to his widow, his son Charles W. Mayo, who has been well trained to carry on a great tradition, and to his daughters. Equally



will they sympathize with his elder brother, Dr. William J. Mayo, who has lost a brother, a confidant, a partner, a friend, and who has seen the end of what was possibly the most wonderful and intimate combination of brothers that the world has ever known. American medicine has lost an inspiring leader, a world-famed surgeon, a great citizen and a lovable man.

Vale et vade Charles Horace Mayo.

#### FRANK HOFFER McMECHAN.

THE death of Dr. Frank Hoffer McMechan, of Cleveland, Ohio, the editor of *Anesthesia and Analgesia* and secretary-general of the International Anesthesia Research Society, which occurred on June 30, 1939, was announced in a recent issue of this journal.

One who knew and admired him writes:

Dr. Frank Hoffer McMechan needed no introduction to anesthetists all the world over. His name was almost a synonym for the organization and education of anesthetists.

His career was in many respects unique. He was a practising anesthetist in the middle west of America until, in about the year 1915, and when he was some thirty years of age, he was attacked by rheumatoid arthritis. The progress of the disease deprived him of the use of almost every joint except the temporo-mandibular. Bedridden and unable even to hold a pen, his career was apparently over. Those who imagined so did not really know him. His courage remained, together with his wide and deep knowledge of anesthesia and his unlimited enthusiasm. He started life anew, no longer as a practitioner, but as a writer and organizer of anesthesia.

His earliest publications appear to have been the "American Year-Books of Anesthesia" for 1915-1916 and 1917-1918. He then edited the *American Journal of Anesthesia and Analgesia*, which formed a quarterly supplement to *The American Journal of Surgery* in the years 1919-1926. A wider field of activity was, however, opening before him.

In the second decade of the present century America possessed many State and regional associations of anesthetists. About 1920, however, a group of leading anesthetists and manufacturers of anesthetic drugs and appliances united to form the National Anesthesia Research Society. Of this organization McMechan was the executive secretary. He was also editor of the society's journal, *Anesthesia and Analgesia*, which he was later to make so famous. The society, during his tenure of the secretaryship, initiated the national annual congress of anesthetists, which has become so striking a feature of North American anesthesia.

McMechan was not content with a merely national organization; his outlook was always international. In 1924 the National Anesthesia Research Society became merged in the International Anesthesia Research Society, a body of strong international affiliations, of which

McMechan was secretary-general. In about the same year the American anesthetic associations united with the Canadian Society of Anesthetists to form the Associated Anesthetists of the United States and Canada. The official organ of all these societies was *Anesthesia and Analgesia*, edited by McMechan. By congresses, meetings, demonstrations and awards for meritorious service to the specialty he and his colleagues of the associated organizations welded North American anesthetists into a homogeneous body.

England had possessed her Association of Anesthetists (now the Section of Anesthesia of the Royal Society of Medicine) since 1893. Anesthetists in other countries were, however, little organized, if organized at all. McMechan began, therefore, to extend the influence of the International Anesthesia Research Society and of its journal into countries outside North America, in the interests of international cooperation. This necessitated many journeys, both within America and abroad, which represented a Homeric achievement for a man in his crippled condition. The difficulties, whether of editorship, or of travel, will be realized when it is remembered that he was unable for many years either to move, to feed himself or to write. That they were overcome was due

entirely to his own resolution and to the efficiency and devotion of his wife, who accompanied and assisted him in all his journeys and activities. The visit of "the McMechans" to the Australasian Medical Congress in Sydney in 1929 will be remembered by Australian anesthetists. It bore fruit in the formation of the sections of anesthesia (British Medical Association) in the various States, out of which sections evolved the Australian Society of Anesthetists.

McMechan's achievement, then, was that from his bed in Cleveland he edited a journal of world-wide circulation and carried out the secretarial duties of several important societies. One of his last major activities was the formation of the International College of Anesthetists. Further, he was the liaison officer for the British, French, German

and Italian journals of anesthesia, and for associations of anesthetists in countries so far removed as Mexico and Australia.

As a man, his predominant characteristic was courage. His days were spent in pain, and it was obvious to him that his tenure of life was precarious. He neither feared nor complained; his conversation was always of the specialty to which he had devoted his life, and of the bright future which he visualized for it but did not himself hope to see. To his courage was added knowledge, both of medicine and of men. More than this, he was a cultured gentleman and one whose habit of thought transcended national boundaries.

He is gone, and anesthesia is the poorer for his passing. He leaves behind him a tradition of faith and service which has influenced and will continue to influence anesthetists in every land. He leaves, too, an inspiration for the future. To his wife, Laurette McMechan, "Mother of Anesthetists", we extend our deepest sympathy and our admiration for courage even greater than his, since it made his achievements possible.



## THOMAS MURPHY.

THE death of Dr. Thomas Murphy on June 27 has removed a personality from medical circles in Melbourne. He will best be remembered through his long association with the honorary medical staff at Saint Vincent's Hospital as a surgeon practising gynaecology.

He was born on July 27, 1865, at Sale, Victoria, and was the son of the late Mr. Luke Murphy, a farmer in that neighbourhood. He and his four brothers were educated at Sale Grammar School, where the seed was sown for a yearning for wide knowledge. The growth was fostered later at Xavier College, Melbourne, where Thomas Murphy completed his schooling and distinguished himself by becoming *dux* of the college. In 1883 he entered the arts school at Melbourne University and graduated in 1885. He then undertook the medical course and obtained his qualifying degrees as soon as it was possible. For several years while at the university he was on the teaching staff at Xavier College and was enabled in large measure to support himself and continue his university studies. His zeal for knowledge will be appreciated when we note that he went on to take the senior degrees in arts, medicine and surgery, and was the first graduate to gain that very fine distinction at the University of Melbourne.

After holding a resident appointment at the Melbourne Hospital he settled down in general practice at Bendigo. By 1907 we find that he had joined the staff at Saint Vincent's Hospital as a surgeon to out-patients and gynaecologist to in-patients. In 1909 he obtained the fellowship of the College of Surgeons of Ireland, and at a later date was a foundation fellow of the Australasian College. He remained the honorary gynaecologist at his hospital until his retirement in 1929 from the active list to become a member of the honorary consultant staff.

As a surgeon he will be remembered as the one who recorded the first case in the literature in which brachial neuritis was recognized as due to pressure of the first rib and was successfully treated by removing the rib, giving complete relief of symptoms. The report appeared in the *Australian Medical Journal* of October 20, 1910, at page 582. The case established the fact that a first rib which appeared to be in normal position might in some patients, under some conditions, cause severe nerve pressure symptoms, trophic and otherwise, in the arm. He published a number of articles in the medical literature over the years, and used to speak of some interesting cases, two of which may be worthy of record, as hitherto undescribed. One was an instance of intussusception due to an intumescent typhoid lymph patch, and the other of ectopic pregnancy with a twin embryo.

He had the honour to be appointed President of the Gynaecological Society of Victoria and of the Bendigo

Branch of the Australian Natives Association. He was a member of the Classical Society of Victoria, and influenced his family to undertake classical and literary studies. He was particularly conversant with the works of Pope and Byron, which he admired, and he had a retentive memory for and a cultured appreciation of poetry.

Though reputed to have been a good sprinter at school and having played a lot of tennis in his youth, reading and motoring formed his chief recreation. For the past nine years his health failed him and he led a life of quiet retirement. He has left a widow, three sons and six daughters. His oldest son, Dr. Leonard Murphy, is a member of the resident medical staff at Saint Vincent's Hospital, and his brother, Dr. John Murphy, formerly the honorary oto-rhino-laryngologist at the same hospital, is living in retirement. Two of his brothers and his oldest daughter are members of the legal profession, and a younger daughter, having obtained the arts degree, is continuing her studies at the Melbourne University, where it is hoped that, in their turn, the younger members of the family will follow on.

To Mrs. Murphy and the other bereaved friends and relatives we offer our sympathy.

Dr. A. L. Davies writes:

Dr. Thomas Murphy held the position of gynaecologist at Saint Vincent's Hospital for a number of years. He was a man of marked ability and great culture. He delighted in the classics and used his knowledge of them in many everyday problems, even in considering the pronunciation of certain words in medical parlance, which pronunciation changes from time to time and with different persons.

He was always a student, and in his work he studied each patient as a new problem.

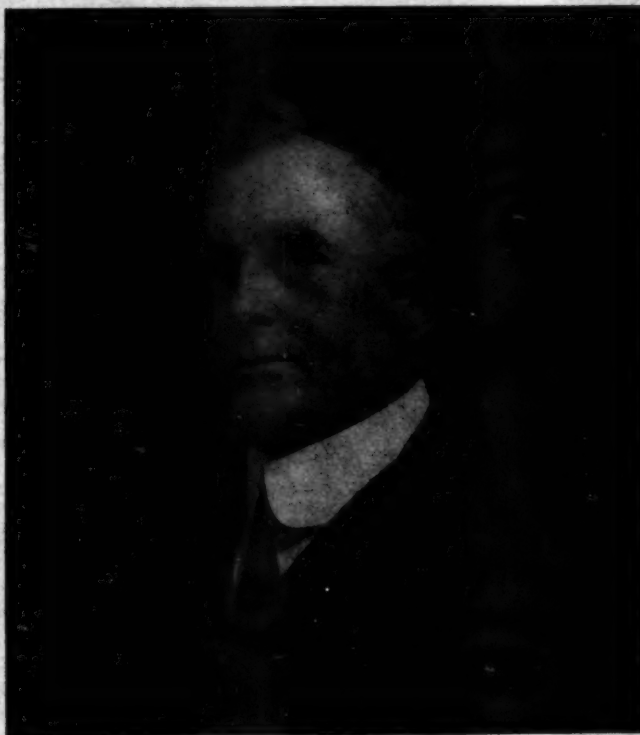
Withal he had a very simple nature, and readily listened to any viewpoint on medical or other matters; however absurd the suggestion, he would discuss it with a seriousness which was hardly merited. For this

reason it was a pleasure to talk with him; and the enthusiasm with which he entered into discussion on trivial matters was quite entertaining.

Of late years he had retired from practice, but his memory will always bring forth glad recollections.

Dr. A. Norman McArthur writes:

When Dr. F. W. W. Morton resigned his appointment as gynaecological surgeon at Saint Vincent's Hospital, Mother Berchman asked me if I could guess whom she was going to appoint. She then informed me that the choice had fallen on Dr. Thomas Murphy, who had been in general practice at Bendigo and had just come to town. I made up my mind to boost him along, as the rest of the staff had an idea that some Collins Street men had been overlooked. Academically no one could have better qualifications than Murphy had: M.D., M.S., M.A., F.R.C.S.I.—what an array of "blue ribbons"! Tom was shy to approach, but later we had many a chat in the surgeons'





room, discussing our work together. In his early days at the hospital he occasionally invited me to watch him at work and to criticize his operative measures. He had a slight tremor of the hands, but his operative technique was sound and, though he showed no surgical brilliance, he was a "safe" operator. Being somewhat temperamental, it gave him too much anxiety to face a case requiring surgical boldness. That he did not like tackling heavy cases was to my advantage, as they were put on to me and I was relieved of a lot of hack work and could devote myself to meeting grave surgical difficulties, knowing that my patients would receive at Saint Vincent's Hospital unequalled nursing care.

Tom was a very interesting man to converse with, as he was so wonderfully well read. He never had a hard word to say of anyone, and was humane, courteous and considerate to those working under him. I gathered from our conversations that he was a very happy family man. I believe he wrote quite a lot of poetry, chiefly about his family, and only for their perusal. He was a very earnest Roman Catholic and helped his church greatly. The community and the profession have by his death lost a distinguished member.

## Congress Notes.

### AUSTRALASIAN MEDICAL CONGRESS (BRITISH MEDICAL ASSOCIATION).

THE following information in regard to the sixth session of the Australasian Medical Congress (British Medical Association), to be held at Perth, Western Australia, from September 2 to 7, 1940, is published for the information of members.

#### Office-Bearers.

The following office-bearers have been appointed.

##### President:

Dr. D. D. Paton.

##### Vice-Presidents:

F. Antill Pockley, M.D. (Edinburgh and Sydney), M.R.C.S. (England), F.R.A.C.S., President of the Australasian Medical Congress, ninth session, 1911, Sydney.

A. C. Purchas, M.C., C.M. (Edinburgh), M.R.C.S. (England), President of the Australasian Medical Congress, tenth session, 1914, Auckland.

Sir Louis Barnett, C.M.G., M.B., Ch.M., F.R.C.S., F.R.A.C.S., President of the Australasian Medical Congress (British Medical Association), second session, 1927, Dunedin.

Sir James W. Barrett, K.B.E., C.B., C.M.G., M.D., M.S., F.R.C.S., F.R.A.C.S., LL.D., Past-President of the British Medical Association, 103rd Annual Meeting, Melbourne, 1935.

D. H. E. Lines, M.B., Ch.B., F.R.A.C.S., President, Australasian Medical Congress (British Medical Association), fourth session, Hobart, 1934.

G. H. Abbott, B.A., M.B., Ch.M., F.R.A.C.S., President of the Australasian Medical Congress (British Medical Association), third session, 1929, Sydney.

Sir Henry Simpson Newland, C.B.E., D.S.O., M.B., M.S. (Adelaide), F.R.C.S. (England), F.R.C.S. (Edinburgh) (Hon.), F.R.A.C.S., President of the Federal Council of the British Medical Association in Australia. President of the Australasian Medical Congress (British Medical Association), fifth session, Adelaide, 1937.

R. H. Fetherston, M.D. (Edinburgh), L.R.C.S. (Ireland), F.R.A.C.S., Vice-President of the British Medical Association, Melbourne.

H. E. Gibbs, M.D. (Edinburgh), F.R.C.S., Vice-President of the British Medical Association, Wellington, New Zealand.

Surgeon-Captain W. J. Carr, R.A.N., L.R.C.P. (London), M.R.C.S. (England), Director of Naval Medical Services of Australia, Navy Office, Melbourne.

Major-General R. M. Downes, C.M.G., V.D., M.D., M.S. (Melbourne), F.R.A.C.S., Director-General of Medical Services, Australia, Army Headquarters, Victoria Barracks, Melbourne.

J. H. L. Cumpston, C.M.G., M.D., D.P.H., R.C.P.S. (England), Director-General of Health of the Commonwealth of Australia, Canberra.

Colonel F. T. Bowerbank, O.B.E., M.D., F.R.C.P., Director of Medical Services, N.Z.M.C., Wellington.

M. H. Watt, O.B.E., M.D. (N.Z.), D.P.H., Director-General of Health of the Dominion of New Zealand, Wellington.

The President and Vice-President of the Federal Council of the British Medical Association in Australia (1940).

A representative of each State Branch of the British Medical Association of Australia and of the New Zealand Branch. (Nominations not yet received.)

#### Honorary Members.

The following have been appointed honorary members of congress:

The Chief Justice of the Supreme Court of Western Australia, Sir John Northmore, K.C.M.G.

The Premier of Western Australia.

The Lord Mayor of Perth.

The Chancellor of the University of Western Australia, Dr. J. S. Battye.

The Vice-Chancellor of the University of Western Australia, Professor H. E. Whitfield.

#### Executive Officers.

Honorary Treasurer: Dr. John J. Holland.

Honorary General Secretary: Dr. Noel M. Cuthbert.

Assistant Honorary General Secretaries: Dr. Hector Stewart, Dr. G. B. Gibb Maitland.

#### Executive Committee.

Dr. D. D. Paton (Chairman), Dr. Noel M. Cuthbert (Secretary), Dr. James P. Ainslie, Dr. T. C. Boyd, Dr. H. C. Callagher, Dr. F. W. Carter, Dr. H. Baldwin Gill, Dr. L. A. Hayward, Dr. J. J. Holland, Dr. Bruce A. Hunt, Dr. L. E. Le Souef, Dr. G. B. Gibb Maitland, Dr. Hector Stewart, Dr. H. Stubbs, Dr. F. J. Clark (representing the Royal Australasian College of Surgeons), Dr. J. G. Hunter, General Secretary of the Federal Council (*ex officio*), the Editor of THE MEDICAL JOURNAL OF AUSTRALIA (*ex officio*).

#### General Committee.

All members of the Western Australian Branch of the British Medical Association.

#### Finance Committee.

Dr. D. D. Paton (Chairman), Dr. Noel M. Cuthbert, Dr. John J. Holland.

#### Committees.

Cinema and Slides Exhibiting Bureau: Chairman, Dr. F. L. Gill; Secretary, Dr. H. S. Lucraft.

Entertainments Committee: Chairman, Dr. H. Baldwin Gill; Secretary, Dr. James P. Ainslie.

Hobbies and Medical History Committee: Chairman, Dr. W. E. Blackall; Secretary, Dr. H. S. Lucraft; Committee, Dr. L. T. Gillespie, Dr. M. L. Creightmore.

Medical Women's Committee: Chairman, Dr. Roberta Jull; Secretary, Dr. Radcliffe-Taylor.

Pathological Museum Committee: Chairman, Dr. B. C. Cohen; Secretary, Dr. S. N. Michaels.

Printing Committee: Chairman, Dr. T. C. Boyd; Committee, Dr. J. A. Love, Dr. M. Kasner Moss.

Reception Committee: *Chairman*, Dr. Bruce A. Hunt; *Secretary*, Dr. H. C. Callagher.

Trade Exhibition Committee: *Chairman*, Dr. F. W. Carter; *Committee*, Dr. Donald Smith, Dr. J. R. Donaldson.

Transport and Accommodation Committee: *Chairman*, Dr. H. Stubbe; *Committee*, Dr. E. J. T. Thompson.

The Assistant General Secretary (Dr. G. B. G. Maitland) will coordinate the work of the Reception, Entertainments and Transport and Accommodation Committees.

#### Committee of Sections.

The Committee of Sections is as follows:

*Chairman*, The President; *Secretary*, Dr. Hector Stewart; *Members*, Honorary General Secretary (*ex officio*), all local Secretaries and Vice-Presidents of Sections.

#### State and Dominion Honorary (Local) Secretaries of Congress.

The State and Dominion Honorary (Local) Secretaries of Congress are as follows:

*New Zealand*: Dr. S. Hunter, 182, Worcester Street, Christchurch.

*New South Wales*: Dr. Wilfred Vickers, 225, Macquarie Street, Sydney.

*Queensland*: Dr. Horace W. Johnson, B.M.A. House, 225, Wickham Terrace, Brisbane.

*South Australia*: Dr. C. B. Sangster, Verto Buildings, 178, North Terrace, Adelaide.

*Tasmania*: Dr. J. H. B. Walch, 171, Macquarie Street, Hobart.

*Victoria*: Dr. F. Kingsley Norris, Medical Society Hall, 426, Albert Street, East Melbourne, C.2.

#### The Sections.

The following is a list of the sections, together with the sectional office-bearers so far appointed. The list of vice-presidents of sections is not yet complete.

*Anæsthetics*: *President*, Dr. Hugh Hunter (New South Wales); *Vice-President*, Dr. M. K. Moss (Western Australia); *Honorary Secretary*, Dr. G. R. Troup (Western Australia).

*Medicine*: *President*, Sir Charles B. Blackburn (New South Wales); *Vice-President*, Dr. D. M. McWhae (Western Australia); *Honorary Secretary*, Dr. J. G. Hislop (Western Australia).

*Naval, Military and Air Force Medicine and Surgery*: *President*, Major-General R. M. Downes (Victoria); *Vice-President*, Dr. G. W. Barber (Western Australia); *Honorary Secretary*, Dr. Lindsay Male (Western Australia).

*Obstetrics and Gynaecology*: *President*, Professor J. C. Windeyer (New South Wales); *Vice-President*, Dr. S. E. Craig (Western Australia); *Honorary Secretary*, Dr. Roland Nattraas (Western Australia).

*Ophthalmology*: *President*, Dr. A. James Flynn (New South Wales); *Vice-President*, Dr. Claude Morlet (Western Australia); *Honorary Secretary*, Dr. D. R. Gawler (Western Australia).

*Orthopædics and Fractures*: *President*, Dr. L. O. Betts (South Australia); *Vice-President*, Dr. R. D. McKellar-Hall (Western Australia); *Honorary Secretary*, Dr. Alec L. Dawkins (Western Australia).

*Oto-Rhino-Laryngology*: *President*, Dr. G. W. Scantlebury (Victoria); *Vice-President*, Dr. H. J. Gray (Western Australia); *Honorary Secretary*, Dr. A. W. Farmer (Western Australia).

*Pædiatrics*: *President*, Dr. F. N. Le Messurier (South Australia); *Vice-President*, Dr. R. H. Crisp (Western Australia); *Honorary Secretary*, Dr. Walter Seed (Western Australia).

*Pathology, Bacteriology and Biochemistry*: *President*, Dr. P. P. Lynch (New Zealand); *Vice-President*, Dr. B. C. Cohen (Western Australia); *Honorary Secretary*, Dr. S. N. Michaels (Western Australia).

*Public Health, Tuberculosis and Tropical Hygiene*: *President*, Sir Raphael W. Cilento (Queensland); *Vice-President*, Dr. R. C. E. Atkinson (Western Australia); *Co-Secretaries*, Dr. J. G. Hislop (Western Australia), Dr. Gerald C. Moss (Western Australia).

*Radiology and Medical Electricity*: *President*, Dr. H. A. McCoy (South Australia); *Vice-President*, Dr. Donald Smith (Western Australia); *Honorary Secretary*, Dr. A. H. Gibson (Western Australia).

*Surgery*: *President*, Sir Alan Newton (Victoria); *Vice-President*, Dr. Theodore Ambrose (Western Australia); *Honorary Secretary*, Dr. F. J. Clark (Western Australia); *Assistant Honorary Secretary*, Dr. Norman Robinson (Western Australia).

#### Cinema and Slides Exhibit.

The committee in charge of the Cinema and Slides Exhibiting Bureau wishes to communicate immediately with all members who can assist in this section. The object of the bureau is to arrange and collect interesting cinema films on various medical and surgical subjects, and also slides of interesting X ray films *et cetera*. All these will be catalogued and will be available for showing at sectional meetings or at the bureau to any member or group of members by arrangement.

In order to assist the organization of this section, all members are requested to fill in the questionnaire attached and to return it at once to the honorary secretary of the committee, Dr. H. S. Lucraft, 252, St. George's Terrace, Perth.

#### Questionnaire.

1. (a) Do you own a cine camera? .....
- (b) If so, state size of film used. ....
- (c) Make and aperture of lens. ....
2. Have you produced any film of medical or surgical interest, suitable for display during Congress? .....
3. Are you prepared, whether you own a cine camera or not, to undertake the production of such a film? .....
- (If you wish to produce a film, but do not possess a camera, arrangements can be made for the loan of a camera, with assistance in the filming.)
4. Have you any collection of lantern slides illustrative of any medical or surgical subjects? .....
5. Have you any series of interesting X ray films or clinical photographs capable of being used for the production of lantern slides? .....

Signature .....

Address .....

#### Hobbies and Medical History.

The hobbies and medical history exhibit includes two separate compartments, and in each one it is already evident that much interesting material will be collected for display.

The early days of medicine in Western Australia will be illustrated by letters and diaries of pioneer medical men in this State, and by documents, books and pictures dealing with matters of historical medical interest. There is a wealth of such material in the possession of the Western Australian Historical Society and in the Perth



Museum, as well as in the hands of private individuals, and in all these quarters support has been promised for arranging a display of the material during congress. The committee is fortunate in this regard in having as one of its members Dr. Cyril Bryan, whose interest in and knowledge of the early history of medicine in Western Australia are unsurpassed. It is also hoped to have for display a number of medical and surgical instruments and appliances of historical interest. A formidable array of these is already assured and will probably be considerably augmented as time goes on.

The hobbies exhibition will also be well worth a visit. Any eastern States member who is interested in botanical matters will be well repaid for the trip to Western Australia by a display of Western Australian flora, the variety and beauty of which are world famous. The hobbies of medical men apparently vary as widely as do those of the lay public. Examples of hand work in wood, metal and clay will be shown; collections of various kinds, from stamps to sphygmographs; ingeniously designed and constructed pieces of apparatus for use in the consulting room or at the bedside. The most popular hobby in Western Australia appears to be that of photography. An excellent display of pictorial photography is already assured, and one member is at present collecting a series of photographs of his fellow members in unorthodox attitudes, which will probably prove to be among the most popular features of the exhibition. Pictures in water colours have also been promised by those more gifted members able to produce them.

The secretary in charge of the hobbies and medical history exhibition would be very pleased to hear from any member in the eastern States who is prepared to contribute in any way to either section. Letters from famous medical men, early surgical instruments or appliances, and any materials of historical medical interest, suitable for display, would be particularly welcomed in the historical section. It is also desired to illustrate as wide a variety as possible of the hobbies of medical men. Exhibits in this section, of course, need not necessarily be of medical interest.

The committee would be grateful if any member who is prepared to help in either matter would communicate with the secretary, Dr. H. S. Lucraft, 252, St. George's Terrace, Perth, Western Australia.

## Post-Graduate Work.

### WEEK-END COURSE IN SURGERY AT SYDNEY.

THE attention of medical practitioners is again drawn to the week-end course in surgery arranged by the New South Wales Post-Graduate Committee in Medicine and to be held at the Prince Henry Hospital, Little Bay, on August 5 and 6, 1939. The full programme for this course was published in the issue of July 1, 1939.

### REFRESHER COURSE AND SPECIAL COURSES IN MELBOURNE.

READERS are reminded of the courses arranged by the Melbourne Permanent Post-Graduate Committee, full programmes of which were published in the issue of May 20, 1939. The annual refresher course is to be held at Melbourne from Monday, August 14, to Saturday, August 26, 1939. The course on gastro-intestinal diseases will be held concurrently with the annual refresher course, the lectures being delivered in the evenings; the course in obstetrics and gynaecology will be held at the Women's Hospital during the following week.

## Correspondence.

### DR. A. E. MILLS PORTRAIT FUND.

SIR: Dr. A. E. Mills, the Deputy Chancellor of the University of Sydney, will be retiring from the senate this year and has expressed his intention of not seeking reelection. Some of his friends think that this is an opportune time to pay a tribute to the valuable services which he has rendered to the community, and have suggested that his portrait be painted and presented to the university. To this end a small committee was recently formed with the Chancellor as chairman. It was decided to commission Mr. W. B. MacInnes to paint the portrait.

Dr. Mills's many friends in all callings and his former students whom he taught both while he was lecturer in medicine and later when he held the position of first professor of medicine at the university may like to subscribe to the portrait fund. Subscriptions may be sent to the honorary treasurer, Mr. H. M. Beresford, at the university. They will be promptly acknowledged. Cheques should be made payable to the "A. E. Mills Portrait Fund".

Yours, etc.

A. P. BACKHOUSE.	J. B. PEDEN.
CONSTANCE D'ARCY.	S. A. SMITH.
ARTHUR L. DAWSON.	R. S. WALLACE.
ARTHUR EEDY.	M. C. ALDER } Honorary
P. HALSE ROGERS.	W. A. SELLE } Secretaries.
FRANK LEVERMER.	H. M. BERESFORD (Honorary
M. W. MACCALLUM.	Treasurer).
C. G. McDONALD.	

Sydney,  
July 17, 1939.

### FOREIGN MEDICAL PRACTITIONERS.

SIR: Professor H. A. Woodruff is reported to have made the following statement in his address to the Unitarian Church Forum on July 16: "If foreign medical men of eminence who are seeking work were allowed to practise in Australia it might be a bad thing for the British Medical Association, but for the community and science of medicine in Australia it would be a great thing."

We should all be very grateful to Professor Woodruff for his hint of a solution of this difficult problem. These people are in serious trouble and it is difficult to know how to help them. Here in Queensland it was found after careful inquiry that all except a negligible percentage were unfitted by training and temperament for the work of a general practitioner in this State. Most of them were either specialists or research workers. To admit to practice in this country practitioners of a country which does not reciprocate by admitting Australian practitioners to practice in their country is a responsibility which cannot be lightly undertaken. And if it is true that they are not fitted by training and temperament for practice in this country, the medical boards might conceivably be failing in their duty to the community by allowing them to practise.

But Professor Woodruff has discovered that they would be of great value to the community and science of medicine in Australia. I do not understand how under these circumstances they might be a bad thing for the British Medical Association; but perhaps Professor Woodruff can explain.

The solution, of course, is now obvious. They should be employed by the universities as research workers. Such work would have an immediate appeal to them and would not entail the necessity of registration. The cost should not be an insurmountable barrier. The salary of most of our university professors places them well above the bread line, and a temporary percentage reduction, such as was made some years ago in the salaries of all Commonwealth

Government officers, would not be any more resented than the call which was recently made upon general practitioners to meet the cost of inquiry into the national health insurance scheme. Professor Woodruff, I am sure, would be the first to set an example by employing one of these practitioners as his assistant research worker and so secure a great thing for the community and science of medicine in Australia.

In any case we are very grateful to him for his valuable suggestion.

Yours, etc.,

GIFFORD CROLL.

Sherwood,  
Brisbane,  
July 18, 1939.

## Proceedings of the Australian Medical Boards.

### NEW SOUTH WALES.

THE undermentioned have been registered, pursuant to the provisions of the *Medical Act, 1912 and 1915*, of New South Wales, as duly qualified medical practitioners:

- Brandt, Donald Sutherland, M.B., B.S., 1939 (Univ. Sydney), 5, Vernon Street, Strathfield.  
 Wilshire, John Matcham, M.B., B.S., 1939 (Univ. Sydney), 17, Claude Avenue, Cremorne.  
 Shera, John Arthur McKelvey, M.B., 1939 (Univ. Sydney), Lewisham Hospital, Sydney.  
 Sewell, Arthur Kenneth, M.B., B.S., 1939 (Univ. Sydney), 5, Deakin Avenue, Haberfield.  
 Pulfrett, Robert Delmont, M.B., B.S., 1939 (Univ. Sydney), "Delmount", Cliff Street, Milson's Point.  
 Pente, Desmond Lees, M.B., B.S., 1939 (Univ. Sydney), 11, Kitchener Parade, Newcastle.  
 Parker, Richard Grey Vernon, M.B., B.S., 1939 (Univ. Sydney), Prince Henry Hospital, Little Bay.  
 Owen, Francis Leonard, M.B., B.S., 1939 (Univ. Sydney), Bapaume Road, Mosman.  
 Millar, Roy Henry Blythe, M.B., B.S., 1939 (Univ. Sydney), 159, Victoria Street, Ashfield.  
 Mankin, Winifred Roby, M.B., B.S., 1939 (Univ. Sydney), 18, Wilga Street, Burwood.  
 Lytle, John Purves, M.B., 1939 (Univ. Sydney), Royal North Shore Hospital, St. Leonards.  
 Hendry, Peter Ian Alexander, M.B., B.S., 1939 (Univ. Sydney), 16, Vernon Street, Strathfield.  
 Frost, Walter Rex, M.B., B.S., 1939 (Univ. Sydney), 16, Birriga Road, Bellevue Hill.  
 Fowles, Winifred Lambert, M.B., B.S., 1939 (Univ. Sydney), 3, Alexander, Henrietta Street, Double Bay.  
 Fitz-John, Jean Marie Lyell, M.B., B.S., 1939 (Univ. Sydney), 16, Hillcrest Avenue, Ashfield.  
 Fennell, Thomas Joseph, M.B., 1939 (Univ. Sydney), 22, Cowper Street, Randwick.  
 Delohery, Henry James, M.B., B.S., 1939 (Univ. Sydney), Prince Henry Hospital, Little Bay.  
 Carter, John Northleigh, M.B., B.S., 1939 (Univ. Sydney), Royal South Sydney Hospital.  
 Barr, Norman Duffin, M.B., B.S., 1939 (Univ. Sydney), 118, Addison Road, Manly.  
 Matson, Thomas Rhodes, M.B., Ch.B., 1927 (Edinburgh), Sydney.  
 Harris, John, M.B., B.S., 1924 (Univ. Adelaide), Shoalhaven Street, Kiama.  
 Pryde, Anthony Machin, M.B., B.S., 1929 (Univ. Melbourne), Broken Hill.  
 Coates-Earl, Agnes Elizabeth, M.B., 1939 (Univ. Sydney), Whare-Koa, Station Street, Manly, E.2, Queensland.  
 Solling, Mena Gwendolyn, M.B., 1939 (Univ. Sydney), Land Board Office, Hay.  
 Hurst, Maurice, M.R.C.S., L.R.C.P., L.M.S.S.A. (London), 1938, Branxton.

## Books Received.

- ROYAL NORTHERN OPERATIVE SURGERY, by the Surgical Staff of the Royal Northern Hospital; 1939. London: H. K. Lewis and Company Limited. Super royal 8vo, pp. 564, with 463 illustrations. Price: 42s. net.
- RELATION OF TRAUMA TO NEW GROWTHS: MEDICO-LEGAL ASPECTS, by R. J. Behan, M.D., Dr. Med. (Berlin), F.A.C.S.; 1939. London: Baillière, Tindall and Cox. Medium 8vo, pp. 437. Price: 22s. 6d. net.
- SYPHILIS AND ITS ACCOMPLICES IN MISCHIEF: SOCIETY, THE STATE AND THE PHYSICIAN, by G. M. Katsalnos, M.D.; 1939. Athens: Privately printed by the author. Demy 8vo, pp. 676.
- ALFRED ADLER: THE MAN AND HIS WORK. TRIUMPH OVER THE INFERIORITY COMPLEX, by H. Orgler, with a foreword by O. H. Woodcock, M.D.; 1939. London: The C. W. Daniel Company Limited. Demy 8vo, pp. 241. Price: 8s. 6d. net.
- FIVE PHASES OF LOVE, by E. S. Chesser, M.D.; 1939. London: Herbert Jenkins Limited: Australia: Angus and Robertson Limited. Large crown 8vo, pp. 252. Price: 9s. 6d. net.
- MEDICINE FOR NURSES, by W. G. Sears, M.D., M.R.C.P.; Third Edition; 1939. London: Edward Arnold and Company. Crown 8vo, pp. 447, with illustrations. Price: 5s. 6d. net.
- DIET AND NUTRITION: A SYNOPSIS FOR NURSES AND STUDENTS OF DIETETICS, by V. L. Collins, M.D.; 1939. Melbourne: W. Ramsay (Surgical) Proprietary Limited. Demy 8vo, pp. 39. Price: 2s. net.
- AN INTRODUCTION TO DERMATOLOGY, by N. Walker, Kt., M.D., LL.D., F.R.C.P., and G. H. Percival, M.D., Ph.D., F.R.C.P.; Tenth Edition; 1939. Edinburgh: W. Green and Son; Australia: Angus and Robertson Limited. Demy 8vo, pp. 408, with illustrations. Price: 30s. net.
- BIBLIOGRAPHY OF THE WRITINGS OF HARVEY CUSHING, PREPARED ON THE OCCASION OF HIS SEVENTIETH BIRTHDAY, APRIL 8, 1939, BY THE HARVEY CUSHING SOCIETY; 1939. Baltimore: C. C. Thomas. Medium 8vo, pp. 123. Price: \$5.00 net.
- THE CLINICAL DIAGNOSIS OF SWELLINGS, by C. E. Corrigan, B.A., M.D., F.R.C.S.; 1939. London: Baillière, Tindall and Cox. Medium 8vo, pp. 321, with illustrations. Price: 18s. net.
- PRECLINICAL MEDICINE. PRECLINICAL STATES AND PREVENTION OF DISEASE, by M. W. Thewlis, M.D.; 1939. London: Baillière, Tindall and Cox. Medium 8vo, pp. 230, with illustrations. Price: 13s. 6d. net.
- THE GENUINE WORKS OF HIPPOCRATES, TRANSLATED FROM THE GREEK, by F. Adams, LL.D., with an introduction by E. C. Kelly, M.D.; 1939. London: Baillière, Tindall and Cox. Imperial 8vo, pp. 392. Price: 13s. 6d. net.
- SEX AND INTERNAL SECRETIONS: A SURVEY OF RECENT RESEARCH, edited by E. Allen, in association with C. H. Danforth and E. A. Doisy, with a foreword by R. M. Yerkes; Second Edition; 1939. London: Baillière, Tindall and Cox. Medium 8vo, pp. 1380, with illustrations. Price: 54s. net.
- THE NEWER KNOWLEDGE OF NUTRITION, by E. V. McCollum, Ph.D., Sc.D., LL.D., E. Orent-Kelles, Sc.D., and H. G. Day, Sc.D.; Fifth Edition, entirely rewritten; 1939. New York: The Macmillan Company. Demy 8vo, pp. 709, with illustrations. Price: 18s. net.
- ANGINA PECTORIS: NERVE PATHWAYS, PHYSIOLOGY, SYMPTOMATOLOGY AND TREATMENT, by H. R. Miller, M.D.; 1939. London: Baillière, Tindall and Cox. Medium 8vo, pp. 290, with illustrations. Price: 15s. net.
- RECENT ADVANCES IN HEMATOLOGY, by A. Pinney, M.D., Ch.B., M.R.C.P.; Fourth Edition; 1939. London: J. and A. Churchill Limited. Large crown 8vo, pp. 310, with 8 coloured plates and 34 text figures. Price: 15s. net.

## Nominations and Elections.

THE undermentioned have applied for election as members of the New South Wales Branch of the British Medical Association:

- Dakin, William Peter Harvey, M.B., B.S., 1939 (Univ. Sydney), Royal North Shore Hospital, St. Leonards.  
 Wherrett, Sydney Wallis, M.B., B.S., 1936 (Univ. Sydney), 340, Marrickville Road, Marrickville.  
 Mutton, John Vernon, M.B., B.S., 1933 (Univ. Sydney), 235, Macquarie Street, Sydney.



## Diary for the Month.

- AUG. 1.—New South Wales Branch, B.M.A.: Organization and Science Committee.  
 AUG. 2.—Victorian Branch, B.M.A.: Branch.  
 AUG. 2.—Western Australian Branch, B.M.A.: Council.  
 AUG. 3.—South Australian Branch, B.M.A.: Council.  
 AUG. 4.—Queensland Branch, B.M.A.: Branch.  
 AUG. 5.—New South Wales Branch, B.M.A.: Executive and Finance Committee.  
 AUG. 11.—Queensland Branch, B.M.A.: Council.  
 AUG. 15.—New South Wales Branch, B.M.A.: Ethics Committee.  
 AUG. 16.—Western Australian Branch, B.M.A.: Branch.  
 AUG. 22.—New South Wales Branch, B.M.A.: Medical Politics Committee.  
 AUG. 23.—Victorian Branch, B.M.A.: Council.  
 AUG. 24.—New South Wales Branch, B.M.A.: Clinical Meeting.  
 AUG. 25.—Queensland Branch, B.M.A.: Council.  
 AUG. 31.—New South Wales Branch, B.M.A.: Branch.  
 AUG. 31.—South Australian Branch, B.M.A.: Branch.

## Medical Appointments.

Dr. D. R. W. Cowan has been appointed Honorary Consulting Physician to the Adelaide Hospital, Adelaide.

Dr. W. Gillfillan has been appointed Honorary Dermatologist to the Mental Hospital, Parkside, South Australia.

Dr. D. G. Picone has been appointed Government Medical Officer at Cooroy, Queensland.

Dr. T. J. Constance has been appointed Clinical Pathologist at the Adelaide Hospital, Adelaide.

Dr. H. G. Wallace has been appointed a member of the Dental Board of New South Wales, in pursuance of the provisions of the *Dentists Act* of 1934 of New South Wales.

Dr. G. H. Solomon and Dr. G. E. Jose have been appointed Honorary Clinical Assistants to the Surgical Section at the Adelaide Hospital, Adelaide.

Dr. D. Officer Brown, Dr. C. H. Hembrow and Dr. R. F. May have been appointed Members of the Masseurs' Registration Board of Victoria.

Dr. O. B. Lower, Dr. W. I. North and Dr. R. S. Wilkinson have been appointed Resident Medical Officers at the Adelaide Hospital, Adelaide.

Dr. A. E. Colvin has been appointed a Member and Vice-President and Dr. M. Harper a Member of the Hospitals Commission of New South Wales.

Dr. E. J. T. Thompson has been appointed Acting Superintendent of the Claremont Mental Hospital, Western Australia.

## Medical Appointments Vacant, etc.

For announcements of medical appointments vacant, assistants, locum tenentes sought, etc., see "Advertiser", pages xviii-xxi.

BRITISH MEDICAL AGENCY OF QUEENSLAND PROPRIETARY LIMITED: Medical Officer.

BALLARAT AND DISTRICT BASE HOSPITAL, BALLARAT, VICTORIA: Radiologist.

BRITISH EMPIRE CANCER CAMPAIGN SOCIETY (INC.), AUCKLAND, NEW ZEALAND: Statistician.

DEPARTMENT OF ROAD TRANSPORT AND TRAMWAYS, NEW SOUTH WALES: Assistant Medical Officer.

SAINT VINCENT'S HOSPITAL, SYDNEY, NEW SOUTH WALES: Honorary Assistant Orthopaedic Surgeon.

TARA DISTRICT HOSPITAL, TARA, QUEENSLAND: Medical Officer.

YEOVAL SUBSIDISED DOCTORS' COMMITTEE, YEOVAL, NEW SOUTH WALES: Medical Officer.

## Medical Appointments: Important Notice.

MEDICAL PRACTITIONERS are requested not to apply for any appointment referred to in the following table without having first communicated with the Honorary Secretary of the Branch named in the first column, or with the Medical Secretary of the British Medical Association, Tavistock Square, London, W.C.1.

BRANCHES.	APPOINTMENTS.
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VICTORIAN: Honorary Secretary, Medical Society Hall, East Melbourne.	All Institutes or Medical Dispensaries. Australian Prudential Association, Proprietary, Limited. Mutual National Provident Club. National Provident Association. Hospital or other appointments outside Victoria.
QUEENSLAND: Honorary Secretary, B.M.A. House, 235, Wickham Terrace, Brisbane, B.17.	Brisbane Associate Friendly Societies' Medical Institute. Prosperpine District Hospital. Members accepting LODGE appointments and those desiring to accept appointments to any COUNTRY HOSPITAL or position outside Australia are advised, in their own interests, to submit a copy of their Agreement to the Council before signing.
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